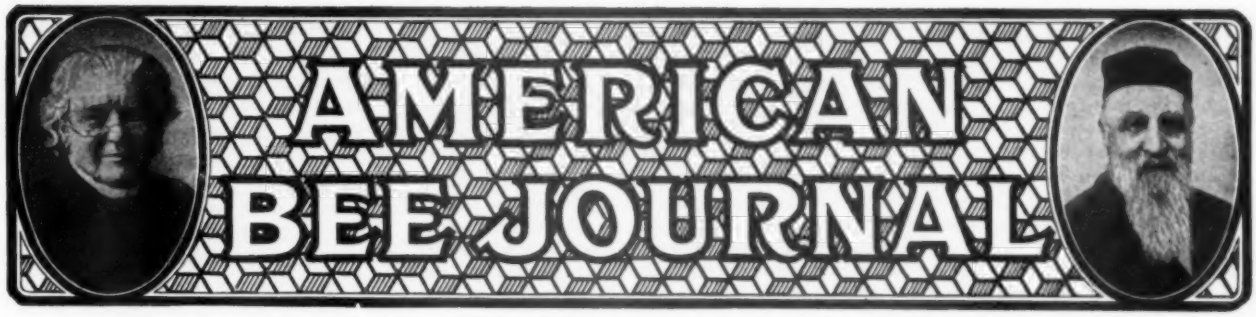

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Does Any Comb Treatment Pay?

By Bruce L. Morehouse
Minnesota

SOME years ago, when my bees first showed A. F. B., it seemed an appalling and unjustified waste to destroy by burning some thirty odd going colonies of bees. I did not realize then that compromising for mere control with a thing as dangerous as this dread bee disease was as risky for the rest of my bees as trying for mere control of a fire in a burning building. I know now that the disease, like the fire, should be completely exterminated.

Some of you may be in the same quandary that I was then. It makes a great difference in one's attitude toward A. F. B., if the disease is in another apiary than one's own. In such cases it is a matter of conversation. But when it is in one's own apiary one comes to the sad realization it is a matter demanding some kind of costly sacrifice to get rid of it.

"Surely," says the beekeeper when he first realizes that some of his colonies have A. F. B., "there is some way to sidestep throwing those colonies into a firey pit. I'll investigate treating the combs with formalin or chlorine gas—I guess they do the trick." So, he goes through the same years of costly treatments of A. F. B. that I did, and finally, I suspect, arrives at conculsions similar to my own. If he chances to read this accounting of my experiences with comb treatments and then agrees with my conclusions, it may save him a pile of money. Or how providential it is for him when the proper authority steps in and takes charge of his problem, solving it for him by fire!

I Tried Formalin.

After following for four years the accepted treatment—of shaking infected bees on foundation, extracting the honey, soaking the combs in water, extracting the water, and immersing the combs in water-formalin, all according to the approved details of this procedure, and with partial success so far as control of the disease was concerned — I looked forward with considerable expectancy to the new and promising chlorine treatment. I was told the bees would accept chlorine treated combs readily, which I will explain further on to be my chief complaint against the formalin-treated combs.

These four years of experience had taught me to discard shaking bees on foundation. The comebacks were too frequent to trust to this uncertain practice. Cyanogas killed the bees in short order, they were burned or buried, so I was shut of that source of repeat infection. That reduced the problem to handling the infected hives.

Yet, with all my pains and expense I was not reducing the amount of infection. Year after year I was finding twenty or thirty additional infected colonies and I do not believe any beekeeper would be more careful than I was to prevent spread of the disease. In fact, I was so careful that my brother did not get the disease in his yards, although we extracted with the same machinery and cared for his bees in rotation along with my own. Circumstances seemed to point to reinfection through the factor of human error in not uncapping sealed cells of diseased honey, or to ineffectiveness of the water-formalin solution. One guess, without actual proof, was that the formalin solution kept the disease from reappearing for one or two years but that later it did reappear in some of such treated combs. Apparently one of these two causes was to blame for not getting rid of the disease. However, in certain instances, some badly infected combs were marked and I have since seen some of them for several years in the brood nests of healthy colonies. Whatever the specific fault may have been under this system of treatment, disease has been an ever-present cause of loss and trouble and I was unable to trace the infection to any outside sources.

I Tried Burning.

In 1931 I decided to await developments in the new chlorine treatment and so burned my infected frames, which made short work of diseased equipment that year. Six or eight empty bodies were first scraped, washed if honied, and then piled up like a chimney. Two sheets of newspaper were torn to pieces and dropped in and the insides thoroughly sprinkled with a mixture of gasoline and kerosene by throwing it on with a paint brush. A hive tool as a pry under the bottom body opened up a draft that burned out the bodies quickly and effectively. A cover clapped over the "chimney" smothered the fire just as the insides were properly charred. This method beats the blow torch a long way for effectiveness and speed. The bodies were then exposed to sun and rain for additional sterilization.

Bottom boards were scraped, washed, and then a mixture of half gasoline and half kerosene thrown on with a large paint brush as the flames charred them. Inner covers, excluders and entrance blocks were put in a tank, covered with several thicknesses of canvas and burlap and steamed for thirty minutes. Undoubtedly such steaming would have done for the bottom boards as well.

I Tried Chlorine Gas.

After carefully studying the chlorine gas treatment, I decided to use this method in 1932, and as an additional precaution, since the treatment was comparatively inexpensive, to treat several thousand extracting

super combs. I followed instructions given by Mr. H. G. Ahrens and Dr. M. C. Tanquary, and thus far have no complaint about the effectiveness of chlorine gas for killing the disease germs. During the summer I visited another beekeeper who made a weaker solution than I used and did not use a gas diffuser. I hope he does not have trouble with reinfection but I would not be surprised to learn that he does. I believe the use of a commercial gas diffuser is important in this method of comb treatment. We may expect to hear of failures in this treatment because of faulty application—it is not fair to judge the method hastily on account of such failures after only one season of experience with it. Surely, improved application will be developed, and I believe it is possible such improvements may remove the present objections to its use.

The tank was out-of-doors, of course. A lead pipe seems preferable to lead from the gas cylinder on the scales to the gas diffuser in the bottom of the tank. I used twenty pounds of chlorine gas for each 600-gallon tankful. This strength of gas will bleach the combs and frames, and sometimes the reinforcing wires are so corroded that the combs are not sufficiently held in the frames to withstand the extracting process and so break. Perhaps a weaker solution may be determined that will be sufficiently strong to kill the germs and still not corrode the wires. Treatment was started in April. The tank was filled at a time when the bees were not flying, with combs that had been carefully looked over for any capped cells of honey. Bodies were not placed in the solution because the gas would spoil the paint, but were burned out as previously described. A chain was thrown over and under the tank to hold on the wooden lid that kept the combs down. If the combs needed soaking in water to remove crystallized honey, a small shot of gas was given to kill germs in the water. New water was used for each batch or soaking of combs. Afterward, the combs were aired in the open from two to ten weeks before being given to the bees.

I Came to This Conclusion.

And now I come to the main point of my contention—**does any comb treatment pay?** From my experience, I should say NO, and this is the biggest why of all. Formalin or chlorine treated frames so repel the bees that the decreased honey yield makes the cost of treatment unprofitable. From comparisons of several years I have come to the conclusion that the honey yield is cut down one-third to one-half per colony when treated supers are given. This loss of honey must be added to the cost of treatment, and usually runs to fifty or more pounds per colony. Such a loss would pay for new frames, with full sheets of foundation, so why keep the old and often poor frames and lose fifty pounds of honey besides?

Only my most vigorous young queens would lay in the treated combs and then only because they were forced to do so or contract the brood nest the same as less vigorous queens would do. Consequently the bee force was soon cut down. Moreover, the treated frames in supers caused honey to be stored in the top of the brood nest during the height of the honeyflow, thus cutting down the brood capacity of the nest. Discovering this, threated and untreated frames were interspersed in the supers and the untreated frames were filled first. Under such natural repugnancy of the bees to chlorine-treated frames is it any wonder that the honey yield was materially cut down?

One point more in comparing the cost of comb treatments with the cost of destruction by fire, and that is the cost of one treatment is not always enough. Reinfection would mean the expense of another treatment in a year or two. It is possible this reinfection more properly belongs to the fault of human error in not uncapping cells of honey in the combs than to ineffectiveness of the treatment solution. The chances of error are rather large, when it comes to uncapping every cell. A surer way of getting every cell uncapped would be to have infected colonies rob out the combs, and we all know such procedure presents its own risks and costs.

I'm not saying that I will never treat infected combs again, because progress in that direction may prove that it would be desirable to do so. But judging from my experiences with short crops because of treated combs, I'm ready to make short work of infected combs by fire, take my loss at one time, avoid a lot of painstaking care with infected honey and combs, and know that I'm through with every diseased colony. Comb treatments involve the possibility of harboring the disease; destruction by fire assures annihilation of the disease along with the equipment that harbors it. In the case of A. F. B. a consuming fire relieves one's mind of many worries and cares. For me, at the present state of A. F. B. knowledge, comb treatment does not pay.

Honey Brown Bread

1½ cups rye flour
1 cup corn meal
2 cups sour milk
½ cup honey
1 tsp. soda stirred in milk
Pinch of salt

Mix well. Steam three hours.

C. J. Oldenburg, Minnesota.

Using Combined Sprays

By E. L. Sechrist
Associate Apiculturist, Bee Culture
Field Station, Davis, California.

The statement in your January Postcript concerning Dr. Rosen's opinion that bordeaux will not be combined with arsenate of lead calls for "the light of experience." The practice of spraying pears in full blossom with the combined spray was started three years ago in the Placerville district of California. It has grown steadily and prospects are that hundreds of acres of pears will be so sprayed in 1933. Of course the beekeepers renting bees for pollination purposes are much concerned, and they move out when the orchard owners begin their spraying.

One extensive pear grower, who applied the blight spray on alternate rows in 1932, happened by circumstances to have a perfect demonstration of efficiency. Active holdover cankers existed undiscovered in his Forel pear trees until well into blossoming time. Blossom blight infections became numerous in and near these trees, diminishing in abundance with distance. A careful check of the blight cutters revealed a startling infection difference in favor of the sprayed rows, i. e., the crews, without knowledge of where spraying had been done, "cut" on the average, only eight unsprayed in the same time required for thirty sprayed trees. The orchard is a large one and these figures are therefore probably significant.

General blight infections in the Placerville area away from canker holdover, were practically absent this season.

This spraying is done when 85% or more of the blossoms are out. At that time sufficient blossoms are said to be pollinated to give a good set of fruit. The fruit growers want the bees, and want to cooperate with the beekeepers, giving them a chance to move their bees out before spraying. This must be done promptly, however, as there is a narrow space of time during which, the growers say, this arsenate-bordeaux spray can be applied to advantage. More and more, the work of the beekeeper must be "on schedule."

Chloroform for Killing Bees

W. A. Rushton, President of Indiana Association reports the use of chloroform for killing diseased colonies in the place of the more dangerous cyanide gas. A small amount of chloroform is poured on cotton in the smoker and puffed into the entrance and then the entrance closed. Possibly a small amount of chloroform placed on cotton rags and stuffed under the frames would do as well with the entrance closed.

Who Is He?

Just by way of fun and interest, let's have our own guessing contest. Jig-saw puzzles are storming the country, intellectuals and morons alike, piles of puzzles melting every day from the book store, news stand, and where you will.

Here's a way to join the puzzle makers. You guess who this big beekeeper is. He's a good start just because of his girth and general good humor. The first three to send in the right guess, will get a little book on beekeeping, cloth bound and illustrated. Now, who is he?

An Interesting Bulletin

From the Saskatchewan College of Agriculture at Saskatoon, comes a bulletin entitled "Alpha Sweet Clover." It is written by L. E. Kirk, professor of Field Husbandry.

In 1924 sweet clover plants quite different from the usual form were discovered. Since that time much attention has been given to selection and breeding in order to establish a new type. Alpha sweet clover is the result. It is characterized by shorter growth, greater leafiness and more numerous and finer stems. In short the new plant resembles alfalfa in its manner of growth while retaining its biennial habit. A single plant may have fifty or more stalks from a single crown, the stalks being no coarser than alfalfa.

Since the bulletin only gives results of the work to the end of 1929 it is probable that the department has secured additional information concerning the value of the Alpha sweet clover since that time. Interested persons should write directly to the department of Field Husbandry, College of Agriculture, Saskatoon, Saskatchewan, Canada, for further information.

Indiana Schedule of Winter Meetings.

We have been supplied with a long list of winter meetings for Indiana beekeepers. They began January 16 but will continue through March, so interested beekeepers should write to the Department of Conservation, Division of Entomology, Indianapolis, to James E. Starkey, Secretary Indiana State Association for list of the meetings that are to come. They embrace many Indiana counties, are held in succession and should be of great interest to the beekeepers of each locality.

The schedules are well worked out in the interest of economy to save gasoline and time in driving long distances to attend the meetings and to help the greatest number of beekeepers. Secretary Starkey is also Chief Inspector of Apiaries and will be accompanied for at least a part of the time by T. C. Johnson, veteran Deputy State Inspector and successful beekeeper of Cass County. Mr. Starkey proposes to discuss brood diseases and their elimination, seasonal topics of management and Mr. Johnson will likely talk on organization and association work. A question box will be a part of each program to cover any particular phase of beekeeping in which members of associations may be interested.

Secretaries of associations should get in touch with Mr. Starkey and beekeepers interested should write to association secretaries or directly to Mr. Starkey at the address given above.

Brittain Entertains

At a meeting of the North End Improvement Club of Seattle on January 26, Mr. Charles Brittain, manager of the Pacific Slope Honey Co., gave a half hour talk about honey. He stressed particularly the health values of the product of the hive, and explained about granulation, how honey might be used in cooking, and its use in the diet of children. About eighty persons were present to hear the talk and enjoy refreshments which consisted of hot biscuits and honey. N. N. D.

Seek to Standardize Washington Honey

The Washington Honey Standardization Act 2 of 1933, or House Bill No. 79, is the name of a bill recently drafted by A. E. Mandery, State Representative from the 20th District of the State of Washington. Mr. Mandery is the brother of Fred Mandery, well known beekeeper and bee inspector of southwestern Washington. This bill provides primarily machinery to keep honeydew out of the table honey sold in Washington. It is "An act to regulate the sale, transportation, loading, packing, marketing, and disposal of honey to prevent fraud and deception therein; establish standards for honey and honey containers; and providing a means for enforcement and for the punishment for violations of its provisions."

Among other things, House Bill No. 79 recommends the use of a series of sizes of containers, accepts the Pfund grader as the standard equipment for determining color grades, and places the enforcement of the Bill, if it becomes a law, in the hands of the State Director of Agriculture. At present time, all regulations governing honey are under the jurisdiction of the Department of Foods and Drugs. N. N. D.

Wyoming Beekeepers Reorganize and Officers Elected

During December the Wyoming Association was reorganized, the constitution changed to meet the present economic situation and officers elected which resulted in the choice of the following officials for 1933: President, Wm. Mosteller, Casper; Vice-president, F. S. Harter, Wheatland; Secre-

(Please turn to page 99)

Where New Ideas Originate

In a recent magazine article the director of the research laboratories for General Motors makes some very significant comments regarding industrial research. He states that although industry has recently spent two hundred and fifty million dollars on research in a single year, no important new idea has been found in ten years. He states that revolutionary discoveries are not made in laboratories, but by workers directly concerned with the application of problems.

The article started an interesting review of the development of the beekeeping industry. Although there is a large sum available for research work in beekeeping in government laboratories and state experiment stations, most of the important discoveries have been made by beekeepers in the apiary. Such progress as has been made by subsidized research is mostly in the way of refinement or of better understanding.

Such discoveries as the bee space by Langstroth, the artificial cell cup for queen rearing by Doolittle, the extractor by Hrushka, and even less important things such as the section box, have all been made by men who were trying to simplify the problem of producing honey.

It is interesting to see that the director of one of the greatest research laboratories should admit that the big discoveries originate elsewhere.

Tell the Public About Honey

A few years ago the writer met some members of the staff of a well known and very prosperous advertising agency. One of these men said that his wife enquired of him how it happened that honey came in small wood frames. He was unable to tell her for he did not know whether the bees put the honey in the frames or whether it was put there by the beekeeper after it was taken from the hive.

This indicates how little the public really knows about bees and their product. There is room for some valuable work in the way of national publicity of an educational nature which will have for its purpose telling the public about honey and how it is produced. Such information always arouses interest.

Not long since, the writer talked to a popular audience about bees in connection with the showing of the new government moving picture films. I think there was only one other beekeeper in the room. When the show was over one man remarked that the picture would result in selling fifty pounds of honey at least to the people present.

If funds were available it would be the logical thing for the American Honey Institute to add someone to its staff with no other work to do than to prepare popular stories about bees for the public press.

About the year 1916 the Greater Iowa organization at Des Moines conducted a campaign to tell the public about things produced in Iowa. The writer prepared a series of short stories about successful Iowa beekeepers which were widely published in the newspapers of the State. As a result there was a surprising demand for honey when the crop came on the market. If this publicity made new beekeepers it was not apparent, but the increased demand for honey was plain enough.

A Good Queen

In the May 1916 issue of this magazine appeared articles by two well known queen breeders, J. P. Moore and G. M. Doolittle on the same subject—"What Constitutes a Good Queen."

It is interesting to note that neither seemed to place much value on color as related to the profit end of the question. Doolittle stated that breeding bright yellow bees offered the best source of profit to the breeder. He also stated that he thought likely a scrub queen in an after swarm in a box in some farmer's yard might be near the top in a contest for honey production with such "bred to the feather queens." At that time the breeding for fancy idea among poultry men was enjoying quite a boom and Doolittle indicated that the trend among beekeepers was similar.

Both agreed that the most important character of a good queen was the honey gathering ability of her bees. To this they added gentleness, and hardiness. Both those men made a real contribution to the beekeeping industry by careful attention to the selection and breeding of queens which were widely distributed among American beekeepers. Within the memory of men who have kept bees for twenty-five years or more there has been a decided increase in the average yield of honey and it is probable that the selection of queens from heavy producing colonies for mothers has been responsible to a great extent for this change.

Of late there has been much interest in the possible development of a strain of bees which might be able to resist American foulbrood and it is not too much to expect that by careful attention to such colonies as show natural resistance, a resistant strain might be bred. If a small sum compared to that now spent in inspection, was spent for this purpose it might result in an immense saving to the industry.

The Change Ahead

It is interesting to note that the few business firms which still seem to be making profits are good advertisers. The fact that so few are advertising offers less competition for what business there is and the active man gets more attention. We Americans are a temperamental people. Just when we had decided that prosperity was to go on forever and there were to be no more hard times, everything went to smash. Now when the bottom has been reached and we are due for an upward turn, most people seem convinced that depression will be a permanent thing.

The majority may rule, but the majority is usually wrong when it comes to looking ahead to see what will be next. The fact that so much interest is being manifested in honey from unexpected sources gives the promise of better days ahead. Never in the memory of the writer has there been so much interest in honey on the part of the public. While prices are low the demand is increasing and this increased demand can have no other effect than to raise prices. "In time of peace prepare for war," is an old saying which might be changed to say, "In times of depression prepare for prosperity." The foundation for America's greatest fortunes have been made in times of great depression. The forward looking man is now getting ready to take advantage of the change which is sure to come.

Big Business With Bees

Hawaii offers the best example of honey production as a big business enterprise. There we have reports of corporations managing several thousand hives. A sugar company was at one time reported as operating about 12,000 colonies. Beekeeping, however, can hardly be expected to become a large scale enterprise as a general thing. There are too many details requiring the attention and interest of the owner to succeed as such big affairs must be managed.

Low Sugar Prices

The beekeeper regrets the low price of honey and the slow market but his problems are simple compared to those of the producers of some other commodities. It is estimated that the Cuban sugar planter gets less than a cent per pound for his crop. The balance of the selling price is consumed in freights, tariffs and handling charges. Sugar to be produced economically must be grown on a large scale. Large scale operations must of necessity involve heavy operating expenses and a burdensome overhead. At present low prices the sugar growers are in a desperate situation.

The beekeeper may find some encouragement in the fact that the products which compete with honey in the market are even harder hit—and can only hope to survive by means of rising prices.

Package Prices Down

Never has the beekeeper had such an opportunity to buy package bees as now. A glance at our advertising pages will find prices lower than ever before. When we remember that express rates on live bees have also been substantially reduced during the past year, we find it possible to stock an apiary at very low cost.

In a locality with a moderate honeyflow in prospect it should be possible to buy new equipment, stock with package bees and with good management pay for the outfit the first season.

The Honeybee Movie

We want to congratulate "Jim" Hambleton on the moving pictures of the honeybee which have been produced under his direction. This is not only a fine piece of photography of a difficult subject but it is a fine example of the splendid educational service which moving pictures might well be. It is unfortunate that with all the opportunities for high class entertainment and education, the movies should so generally be devoted to featuring crime and sex.

Many of us who greatly enjoy a good show have about given up depending upon the pictures for entertainment because we have so often been disappointed. When one goes to a show expecting something worth while only to find a showing of gunmen and questionable morality he feels little inclined to repeat the experience. There are millions of Americans with that attitude who might be considered in the making of films. We want something beside technical perfection in acting.

The widely heralded cleaning up of the pictures which was to come with the appointment of Hayes as official censor of the industry has not come up to expectations. Rather he seems to be occupied principally in keeping the public quiet and preventing criticism as far as possible.

Growth of Crime

A Pennsylvania reader sends us a newspaper account of the Pennsylvania Farm show written by a lady reporter. She mentions the fact that with an attendance of more than sixty thousand daily, she did not see one drunk, hear a single cuss word or witness a single improper or disagreeable incident. Crime does not flourish on the farms, it is rather a product of large cities. Producers of primary foods such as fruit, grain and honey are usually law abiding people. We cannot but be concerned, however, with the drift toward crime which is so prevalent just now. The modern newspaper and the moving pictures feature the criminal so constantly that they make crime attractive to weak minded young people.

Much of the responsibility also lies with the lawyers. Instead of helping to secure justice as they are bound by oath to do, they use every trick to defeat it. No matter what crime a man may be known to have committed his lawyer will do everything possible to help him escape his proper punishment—for a fee. The safety of the country is in the hands of the legal profession and they have betrayed their trust. The writer having for a time, been a member of the bar, regrets the attitude of the profession toward the criminal.

Too Big

A few months ago a well known commercial honey producer who operates on a large scale remarked to the writer that it is easy to expand too far. He stated that many beekeepers who make money as long as they can do most of their own work, fail when they get a big outfit which requires large outlay for hired help.

In boom times the bigger they are the larger the profits, but in times of stress the heavy overhead not only consumes the profits but the capital investment as well.

Beekeepers with outfits within their ability to handle with only the help of the family are getting along easier now than men in most other lines of business. Small farmers in every line who are free from heavy debt are able to meet the situation very comfortably, in comparison to larger ones.

Now is the most favorable time to increase one's outfit because prices are so low and outfits are often for sale at bargain prices. If one moves cautiously and stays within reasonable limits, now is a good time to make additions to one's business.

Breeding Better Bees

So little serious attention has been given to selection and breeding of the honeybee, that it is surprising that so much advance has been made in the industry, especially in increased production. Such work as has been done has largely been haphazard. If the beekeeper found an especially good queen he might rear a batch of daughters from her, but for carefully continued selection for generation after generation there has been little.

Let us hope that Doctor Watson's enthusiasm for breeding may lead to some extensive and carefully supervised work along this line. We read of the results of numerous poultrymen who have continued to select their most productive fowls and breed from them until large increase in egg production has resulted. The December issue of Northwest Poultry Journal tells of the work of L. E. Arnold, an Oregon poultryman who raised the average egg production of his flock of hens to more than 240 per year by trapnesting his fowls. The hens which laid the largest numbers of eggs were used as mothers. The past year thirty-four pullets laid more than 300 eggs each and one of these laid 335 eggs in one year.

It is quite probable that similar selection of the best producing bees continued over several generations would increase the average crop of honey per hive in similar manner.

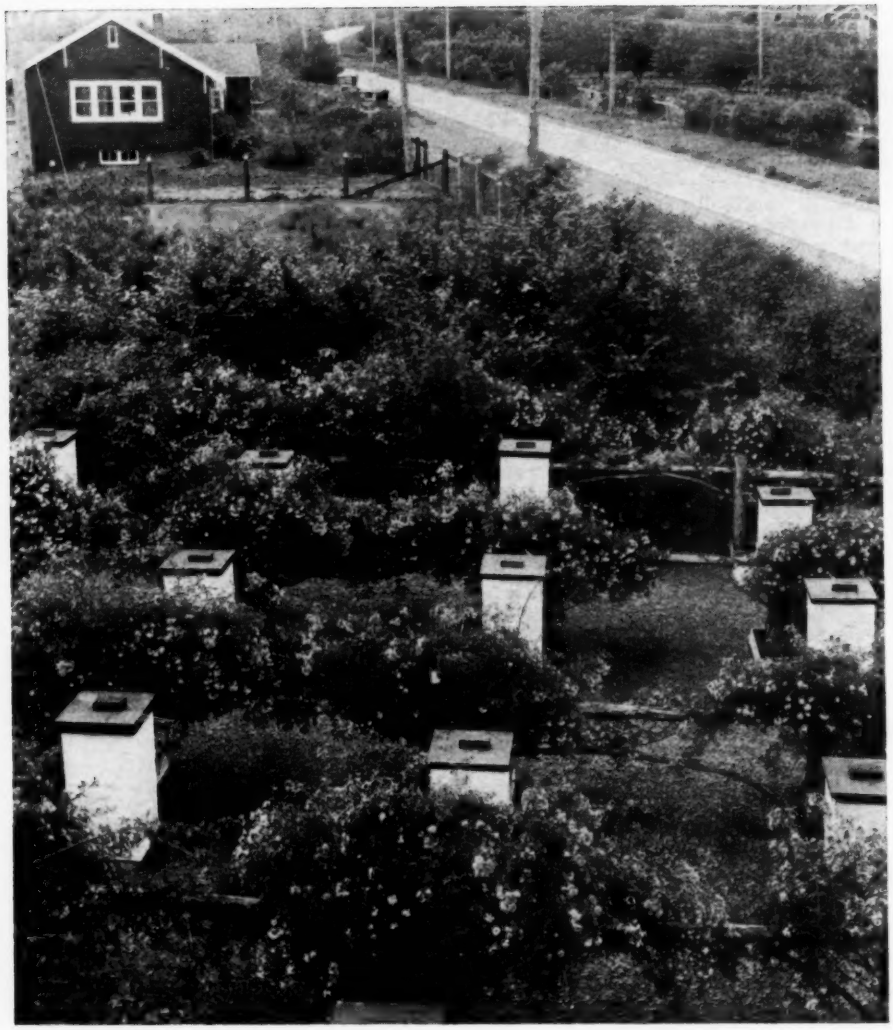
Honey As Nature Made It

There is a serious question as to whether it is possible to improve upon nature in the treatment of honey. Heating to retard granulation, filtering to remove dark colors and other processing all remove something of value to the product. Honey is the result of uncounted centuries of development in a natural laboratory and it appears to the writer to be near to perfection as a food product when it comes from the hive.

For his own table the writer would not buy honey which had been heated, filtered or otherwise processed. Whatever advantage honey has over commercial sugar is because of the additional elements which it contains. Heating changes the nature of these and filtering removes them. If our industry is to become prosperous it is likely to be because we capitalize on special qualities of honey rather than by trying to remove them to make our product appear like sugar.

If we want an invert sugar we have only to buy corn sugar or corn syrup at a lower price than honey can be sold. A white syrup can be made from cane sugar at a low price. Honey with its peculiar elements filtered out is little more than sugar syrup.

Instead of trying to change the character of our honey let us find out the value of every element which it contains and then capitalize these peculiarities. With a product which no manufacturer can duplicate the beekeeper should have no difficulty in creating a demand which will consume our surplus at a living price.



This is the corner of the apiary at the Experiment Station at Saanichton. The beekeeper, with his little, may not be able to duplicate it, but how often he could improve, with the labor of his hands, to make a bee yard a thing of beauty.

The Pollination of Fruit Trees

by E. M. Straight

Superintendent, Experiment Station,
Saanichton, British Columbia

THE problem of fruit growing has been attacked from many standpoints and with eminent success, yet the sum total of our knowledge relative to the pollination of fruit trees in Canada is meagre enough. In fact little has been attempted in this line, one of the most important connected with productivity in the orchard. Worst of all, the honeybee, the chief carrier of the pollen, has been given little or no credit for the important work it does. If honey had no value, fruit growers would be well advised to keep bees, or to offer a bonus to any man who would keep them in their orchards.

For many years the Experiment Station, Sidney, B.C., has been recommending among the pears such well known varieties as Bartlett, Dr. Jules Guyot, Bosc, Anjou. Situated as these trees are in the midst of an orchard of fifty or more varieties, it is impossible to know from casual observation what effect cross pollination may have upon the set. To the small grower, having one or two varieties only, the problem is entirely different; complex in nature and one concerning which the wisest may not venture an opinion, except based on exact knowledge, experimentally determined, covering the variety in question.

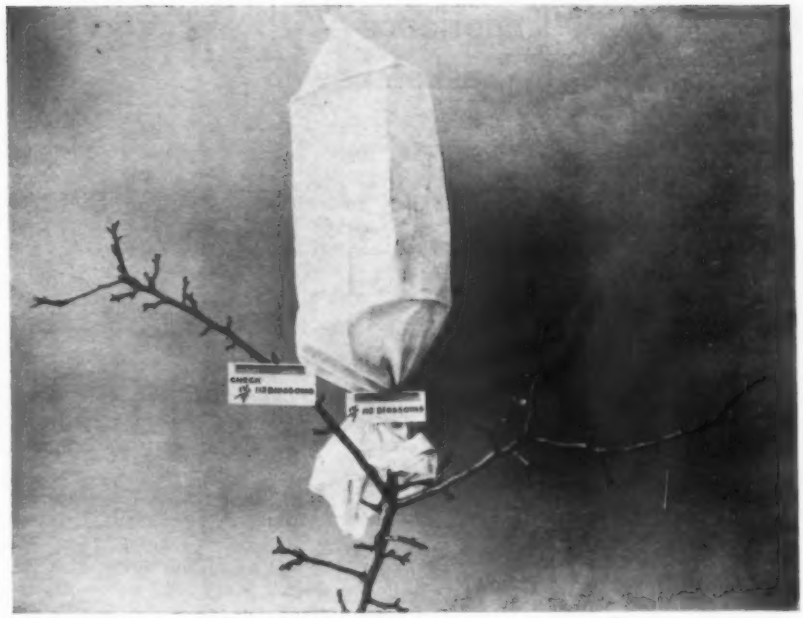
In studying the problems set forth, the common system of caging, emasculating and hand pollinating has been used and may be briefly outlined as follows. Just before the fruit bloom opens a cylindrical wire framework is fitted over the branch of the tree to be studied. The blooms thus enclosed are counted, recorded and a cotton bag drawn over the caged branch and secured firmly at the forward end by means of string, as shown in the illustration, Figure 1. The bag is left on until all the blooms have set that are likely to set, and the petals fallen. On the removal of the bag the number of fruits set is recorded, also the fruit set on a check branch which has been labelled since the time of installing the cages. For purposes of comparison the check must be kept in every case. To insure greater accuracy throughout, the work with every variety must be carried in duplicate over the whole period.

For those who may not be familiar with the parts of the flower, it may be stated that the calyx, composed of sepals; and the corolla, composed of petals, outer circles of leaves, and most conspicuous in the flower, taken together are sometimes spoken of as the floral envelope. This floral envel-

ope has no great value, except to attract insects and to afford some measure of protection to the stamens and pistil within. The business of the stamens is to produce pollen. This pollen dust falling on the stigma, the upper part of the pistil, grows down to the base and unites with the ovules. This union of cells is the beginning of the little plant found in every true seed.

Thus it will be seen that the stamens and pistils are the essential parts of the flower. The function of the cage is to force the variety to pollinize itself, if it has the power to do so, while the uncaged flowers are open to every passing insect, and every pollen laden breeze that stirs the branches. If the stamens are removed before they have produced pollen, and foreign pollen introduced by the plant breeder, of a known variety, the resulting offspring should carry the unit characters of the two unlike parents. This process is spoken of as crossing, but the unlike characters do not appear in the edible part of the fruit during the season in question, but should appear if the seed arising from the cross is planted.

During the first year of the work the results obtained were startling. Of the fifty varieties of pears grown, nearly half were entirely self sterile, while only two were quite as fruitful, self pollinated, as those exposed to miscellaneous pollen outside the cage. Owing to climatic conditions, such as rain, cloudiness and sunshine, variations are sure to arise, appearing in records taken over a period of years, but the following have shown complete self sterility for the entire time: Anjou, Beurre Diel, Beurre Hardy, Doyenne du Comice, Louise Bonne de Jersey, Madam Ballet, Passe Crassane, Pitmaston Duchess, Princess, Triomphe de Vienne, Virginie Ballet, Vicar of Winkfield and Winter Nelis.



Pollination under control. The story should be easily told.

The following are so nearly self sterile that they may be so regarded: Boussock, Clairgeau, Doyenne d'Alencon, Forelle, Glou Morceau, Howell, Koonce, Le Lectier and Worden Seckel. Many other varieties yield only a fraction of what they should if properly pollinated.

There are many statements to the effect that all varieties, whether self sterile or not, are more fruitful when foreign pollen is available than when the varieties are forced to pollinate themselves. This is not to be wondered at, for the same is true of many species. It is interesting to note that in the work done here, only in two or three instances has self-pollination given results equal to "normal set." Cross pollination has been at tempted under control with the following varieties: Anjou, Bartlett, Boussock, Clairgeau, Louise Bonne de Jersey. The effect of many sorts of pollen has been tested. The results are available but complex and too much drawn out for an article of this kind.

No doubt the wind is a factor in helping to pollinate certain varieties. We are satisfied that this is true; many insects perform their part, but watch the honeybee and be convinced. For the most part the bee stays with the one species all day, visiting flower after flower, depositing part of its pollen load here, picking up other pollen grains, all unconsciously, yet doing its work of cross pollination well, and as no other agency could do it. The honeybee, working for nothing and finding herself, deserves a kindlier feeling than that usually tendered her.

A "close up" of the same apiary shown on opposite page. What a satisfaction to work in beauty like this!

Clean Up Disease at Once

If beekeepers with foulbrood want to do a thorough job, let them boil their combs, frames and all and get what wax they can. Sterilize the frames and I believe they will be money ahead. I kill every colony that shows disease. So far I have only had it one season and that was two years ago and I lost six colonies. I feel that only by doing a thorough job can disease be quickly controlled. Be cautious and do not allow robbing.

Joseph Ferreira, California.

Nine Years of Experience With Package Bees in Saskatchewan

By H. J. Minall
Saskatchewan

OUR location here in southwest Saskatchewan, in what is generally known as the semi-arid or subhumid area, is not ideal for honey and in winter we are subject to rapid changes in temperature. We can have thirty or more degrees below zero and inside of forty-eight hours, experience a Chinook wind, with melting snow and water running in the streets. That goes to show that wintering bees here is not easy. Losses are heavy and package bees are depended on to keep up the count.

I have had an interesting experience in receiving packages each spring. The packages came from different places in different sorts and sizes of containers. Also, before the law prohibiting importation of bees on comb, I had packages with three standard combs of bees and brood but these did not seem to do as well for me as combless packages.

The first packages I received were three 1-pound packages ordered to arrive by May 1st. Instructions were sent with the order and cash too, to a large firm during the winter so there would be plenty of time, but the packages did not show up until the middle of June. In spite of this late arrival, they built up quickly and gave a small surplus.

The next year I ordered from two different places and if both shipments had arrived, I was ready for them but one firm sent back the money and the other shipment landed here early in May in poor condition. The bees in two packages were all dead. A claim was put in for replacement and two packages were sent in their place. The shipper used such heavy cages for these two packages that although no charge was made for the bees, they cost me $6.10 for express alone at a time when our money in Canada was on a par with United States money.

From this, I learned not to ask for replacements, because it calls for double transportation costs against each package. For any bees since then received in bad order, a claim has been put in with the railroad for return of cash in pay for the bees and transportation charges and I have never had a claim refused.

One shipper from the south sent his bees in such shape that when they reached here, they were nearly all dead, lots of feed left in the cans, but he had used cans with small metal lugs soldered on the bottom to hold them up and, in transit, these lugs had broken off, the cans had dropped down and were rolling around on the bees so they were not only starved but crushed.

I ordered packages from both the south and from California and I found one shipper in California whose shipments always arrived in the best condition. The losses were nearly all from the south but the express charges from California were so much higher that I continued to order from the south.

On one shipment of thirty-five 2-pound packages from California, the express charge averaged $1.36 per package and on many, more than this. The railroad people did not seem sure as to what should be charged at that time. Packages from the south had been sent for less than $1.00.

It has often happened that bees arrived here in the middle of a wintery spell in late spring and it looks like a mean trick to bring these bees from the sunny warm climate and a few days after they are hived to see the hives covered with snow. Several times packages have come when it was so cold that scarcely any life could be seen among the bees. I have taken them into the house then and thawed them out before deciding whether they were all dead or not. It is always surprising the number that survive. In most cases, however, the chilled queens do not last long. They live for a short time and then become drone layers. [This is found true with packages of bees received here too early.—Ed.]

When first receiving package bees, I would take out the queen cage, examine it, then make a hole through the candy and insert the cage between two frames. After dumping a few bees on the queen cage, the package was put down in one side of the hive and left. They were, of course, given combs of feed and pollen. But in several cases I found that the cold nights were too much for the small cluster around the queen and the other bees never left the cage. The small cluster and the queen would perish so that now, no matter what the weather, I have taken the queen out and tipped all the bees out over her cage, leaving them until the following day to take away the cage after the queen had left it. Sometimes, through bad weather, I would leave them several days before opening the hive to take out the cage and would always find large pieces of comb built down from the cages and quite often eggs in the comb.

I have had some trouble with queens coming with packages but not much. I usually give package bees old combs with both honey and pollen. Some shippers use small discs of cardboard to close the candy end of the queen cage and in several cases these discs have dropped out and the queen was loose among the bees before arrival so I was annoyed at not being able to find the queen easily. I can say that I do not worry about this now as I have never had a queen go bad that was loose before the bees arrived.

One queen in a package was dead and all the attendant bees in her cage were dead, so I decided to hive the bees and put a weak wintered-over queenright colony above them, but in tipping the bees out of the shipping cage I saw a fine young queen run out with the bees so I left them alone and this colony did well. What had happened to the queen in the cage? It had not starved as hardly any candy had been eaten.

On November 10th last year, I put the bees in the cellar, except two colonies that had built up from packages. They were very strong so I decided to experiment with them. They had a 50-50 break to live if I put them in the cellar. I have noticed that it is the strongest colonies that die in the cellar.

So these bees were left out and empty supers put on three sides of them. It was my intention to put straw all around them but owing to sickness and severe weather, this was not done and I thought they had perished but, during a mild spell here on January 9th, these bees had a good flight for a short time at noon.

On that day ducks were playing in the pools of water in the yard and today, the same week, there is a blizzard and it is twenty degrees below zero. Mentioning this cold weather reminds me to say that I enjoy reading articles on life in the warm south. I would like to visit there in the winter but will have to wait until wheat gets above twenty cents per bushel before we will see any money again but sure have to thank the bees for helping us through these tough times.

A Queen Bee Eight Inches Long

One of the many interesting sights witnessed by the beekeepers attending the 43rd Annual Convention of the California State Beekeepers' Association in Riverside, was the electrified model of a queen honeybee, at least eight inches long, walking back and forth in a nailless queen cage of mammoth proportions. As the queen passed through the middle compartment of its cage, it fluttered its wings and made a noise very much like a real queen often makes when placed

in a mailing cage. When it reached the end of the cage, it very deliberately turned around and repeated the performance by walking the length of the cage in the opposite direction.

It was a very ingenious mechanical arrangement and parts of the "internal anatomy" of this queen had to be housed in a table of special make that was larger than the top of a card table. It took Mr. A. B. Pinard of San Jose, California, the greater part of all his spare time over a period of six months to make his pet work successfully and he deserves praise for his ingenuity and perseverance. If this model is shown at the next California State Fair, it surely will attract much attention.

Mr. Pinard is the inventor and manufacturer of the Nailless Queen Cage. He told the writer that he invented the cage after he had assembled an order for several hundred cages of the old type in which the wire tops were fastened with small nails. He said that he got tired of hitting his fingers more than the tacks and thought queen breeders would appreciate a cage on which nails are not used.

J. E. Eckert, California.

Sap Sucker Damages Hives

In early winter I noticed a bird I had never seen here before in the winter time, a small species of wood pecker ordinarily known as a sap sucker. This bird found wonderful satisfaction apparently in cutting into the hand holes in the sides and ends of hive bodies clear through the wood. Although I could never find where the bird had injured either bees or honey, they did leave the hive broken into in a way to permit robbing. I kept closely in touch with the damage and prevented any robbing, however.

J. H. Sturdevant,
Nebraska.

Mice Damage

The damage that mice can do to bees in a short time is surprising. I have an apiary in a forest of evergreens which furnishes excellent cover for field mice. In November and December the weather was mild so I did not contract the entrances as early as usual. On Thanksgiving day a colony was in excellent condition. On December 12, there was not a bee in the hive, but there was a nest of field mice in the brood chamber and four combs had been eaten away.

Apparently the mice had entered on a cold day and the bees swarmed out and united with another colony as there were few dead bees in front. Not a drop of honey remained in the hive showing that other colonies had robbed it, since it was well supplied with honey in the fall.

S. F. Haxton, Pennsylvania.

A Crop of Honey from Giant Hyssop

By George H. Vansell
Associate Apiculturist
Bureau of Entomology, U. S. D. A.

Hyssop. The California plant is heavier and may grow in thickets to the height of ten feet.

Giant hyssop, **Agastache urticifolia,** is abundant in the high Sierra Nevada of northern California. An extreme in nectar secretion worthy of record has come under observation. During July of 1931 a surplus of 100 pounds to the colony was harvested in Eldorado County but in the same location no honey was secured for 1932. The species appeared equally abundant and vigorous both seasons. Honeybees paid no attention to the blossoms in 1932 although they were visited freely by bumblebees, carpenter bees, butterflies, and humming birds.

The honey was of fine quality with a somewhat mintlike flavor. No tendency to granulate was evidenced for several months after extraction. When first extracted it was water white and of good body.

The photograph of a hyssop on page 547 of the American Bee Journal for 1926 resembles the California species; however, this western plant is of heavier build. It grows to a height of 10 feet, especially in thickets of ceanothus which protect it from destruction by the sheep pastured in the high mountains each summer.

Briefly, Here Is a Picture of American Foulbrood

Notwithstanding all that has been published concerning foulbrood and its treatment, there are thousands of beekeepers who are unable to diagnose the disease. In brief, here is how it may be done:

Examine the brood carefully, and, if a dead cell is found, draw out the contents with a toothpick. If it comes out like a sack filled with water, that is sacbrood—not serious. If curled around in the back of the cell, sour smell, cappings not much perforated, it is very apt to be European foulbrood—easily treated if you know how. If brown in color and dropped down and flattened out on the lower floor of the cell, tongue sometimes sticking up and fastened to the upper part of the cell, a brown sticky mass that may be drawn out in a string or "rope," ragged perforated cappings and foul smell in advanced stages — that's American foulbrood, and when the first dead cell appears it's time for the beekeeper to get busy.

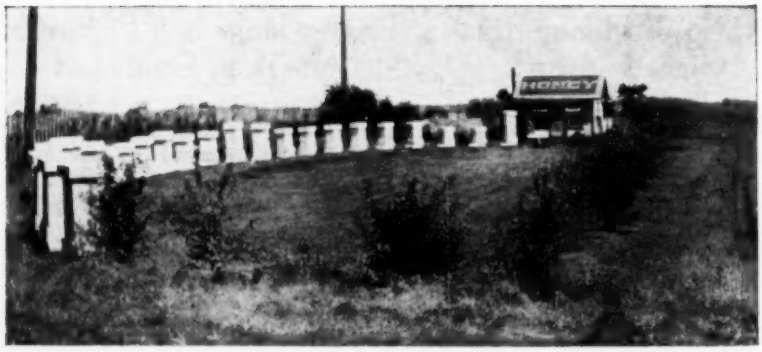
In localities where American foulbrood is prevalent every colony should be inspected carefully in the fall before the brood is all emerged and the cells are filled with honey. A colony with a single cell of foulbrood in September will be rotten with disease next spring if kept over, and may be the means of infecting a whole apiary. Unless one has a considerable number of diseased colonies, knows the nature of the disease and the correct mode of treatment and is properly equipped for the work, it doesn't pay to disinfect by means of formalin or otherwise try to save combs. It is less expensive in the long run to gasoline the bees and burn the combs. Don't wait for the inspector; do it yourself and do it at once. But remember that the disease germs are carried in the honey, so don't spill a drop of it. Don't let any bees escape to enter other hives, and don't allow a single robber bee to nose in. If you do, your work will be in vain.

E. S. Miller, Indiana.

Loss of Honey in Emptying 60-pound Cans

How much honey sticks to the inside of a 60-pound can when it is emptied after the honey is heated for bottling? Actual weighing of several cans shows that this amounts to two or three ounces. (We have noticed losses as high as 6 to 8 ounces. If the honey is still hot the loss cannot amount to an ounce.—Ed.)

S. F. Haxton, Pennsylvania.



A neat layout for one of Mr. Eldred's yards; honey house at one end. A touring car, with parts of body made to suit, is used in the bee work.

Let the Machine Do Your Work

By M. G. Eldred
Illinois.

THIS is called the machine age and properly so. Some of us can remember when in some lines of work a man labored seven days a week from 6:00 a. m. to 5:30 p. m. Then came the six day week and later the five and a half day week and soon there may be the five day week of forty hours, much spare time, but less income, due principally if you please to the "Machine."

But why rave at the machine? Accept things as they are and go in the same way. Most of the really efficient workers in the city, were reared in the country and present conditions will gradually drive people back to the country to boost their dwindling incomes by making a living from the soil and selling small surpluses while still holding down the city job.

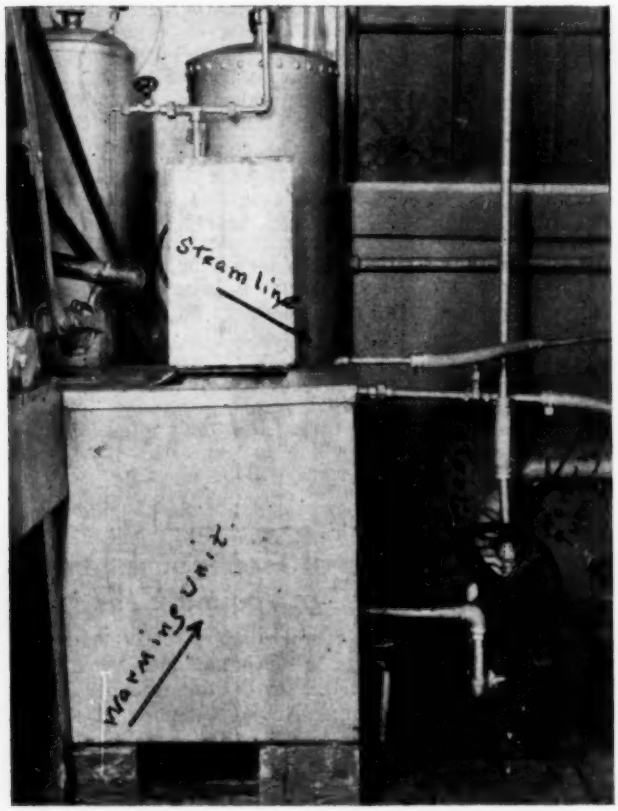
With the help of machinery and rapid transportation, the city man may live in the country, enjoy its benefits and still have the advantages of the city. This to my notion is an ideal condition.

Naturally some will take up gardening; others flowers and bulbs; some poultry; many will raise mushrooms, cultivate mint or other plants. Personally I solved the problem to my satisfaction by the keeping of bees and the sale of honey.

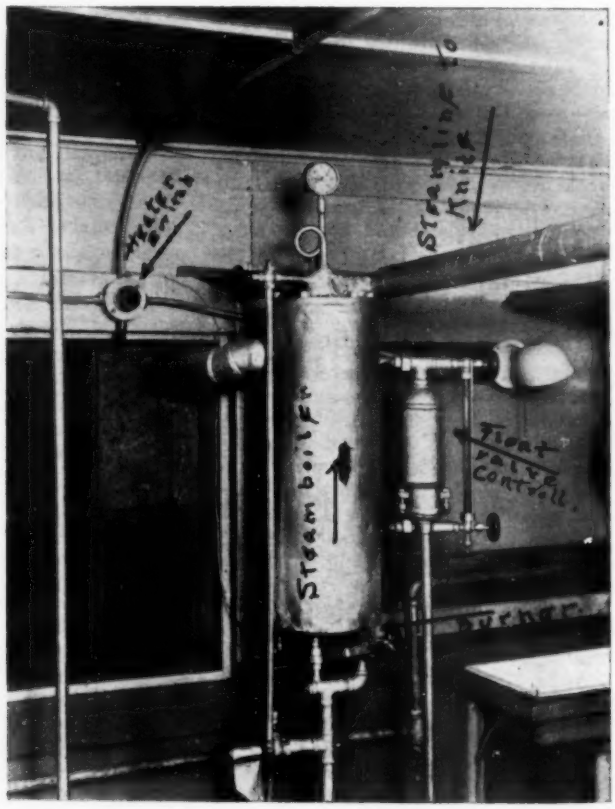
Honey for table use may be purchased cheaper than it may be raised if the pleasure of beekeeping is left out of the picture. However, with the aid of machinery, this business of honey production can be made to pay better than anything I know of, if as much thought and study are put into it as is required to hold the city job. **And it can be done in spare time on a small amount of land, in a favorable location.**

The idea of my story is to try and show how a pleasant and profitable business may be developed as a side line with the help of simple and inexpensive machinery, which will enable one to produce a superior and salable article of food.

Any man with the ability to handle tools and not afraid of a little hard work can build up such a business



No. 1.—Jacketed warming unit. Heated honey is pumped to the settling tank in picture 3. Parts of this warming unit are described on page 90.



No. 2.—Boiler with burner, steam lines and water switch. Note float valve control, window exhaust pipe. Also handy light and sink with plenty of water.

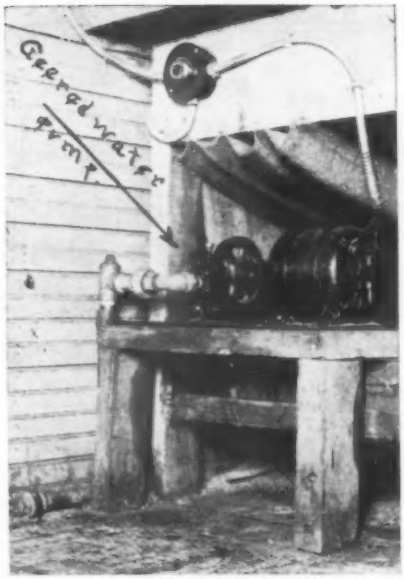
and operate it for both pleasure and profit.

The Machinery Needed.

You will see with this story a picture of one of our small apiaries of 25 colonies which was built up from 25 3-pound packages of bees installed in their hives the first of May in 1932. At the back of the picture is the shop and extracting room which I built from scrap lumber in my spare time at a cost of less than $100.00 The little house is 12 feet by 26 feet. The truck with which I do my hauling was made from an old touring car—but that is another story.

Of course in my business of honey production, I use the ordinary equipment and tools of beekeeping. For instance, honey taken from the supers is placed in an uncapping rack, uncapped with a steam heated uncapping knife and the cappings rendered in a cappings melter. The wax cappings are thus reduced to cake wax with the least trouble. The melter is heated by the exhaust from the steam knife and the condensation is later utilized to scrub up the shop with a painters scrubbing brush.

I use a 2-basket extractor, extracting two combs while I am uncapping two. The machine runs at 300 R. P. M. by an overhead belt and shaft from a friction clutch which starts the reel slowly, preventing breaking of combs. After the honey is extracted from one side, the baskets are reversed and the other side extracted. This is really a hand extractor fitted up to run by power.



No. 5.—Quarter horse-power motor and gear water pump to fill water supply tank in No.4. Pressure switch in No. 4 automaticaly kicks in this unit when the pressure drops to 20 pounds.

Cold honey cannot be strained by ordinary means, but we get our first straining or removal of the larger particles of wax by bolting a galvanized wire screen to the outside of the reel of the extractor. The centrifugal force, of course, carries the honey through the screen but leaves all the coarse particles of wax behind in the extractor. The honey then flows by gravity feed into the warming unit.

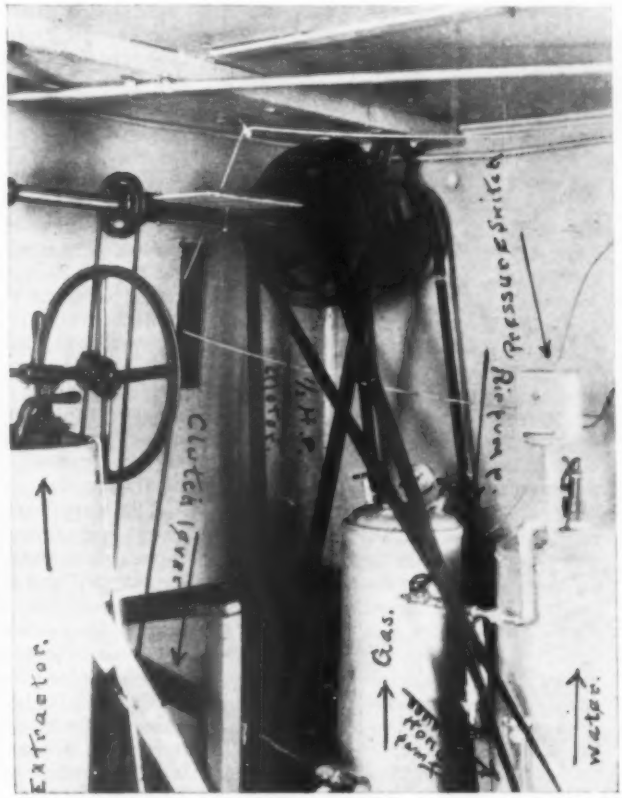
The Warming Unit.

This is a water jacketed device (see picture No. 1 and also see pictures for parts and construction on page 90) one inch deep all around the sides and ends and from one inch to four inches at the bottom. The honey is heated by passing in a small stream over the bottom, traveling approximately 17 feet by the use of baffles placed four inches apart as shown in the picture. The water is heated by a steam line from the boiler. An auxiliary electric heating unit is used under the warmer if more heat is needed.

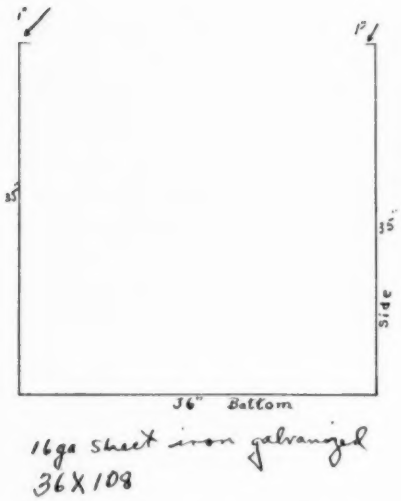
We also show a picture (No. 2) of the kind of boiler used, with steam lines to the uncapping knife and to the warming unit. When the honey is heated to 140 degrees F. it is pumped by a gear pump (by belting from the pulley shown in picture No. 1 to a shaft pulley overhead) and the hot honey is carried through galvanized overhead pipes and down through fine cheesecloth screens into the settling tank (see picture No. 3).

The weight of several hundred pounds of liquid honey forces out all

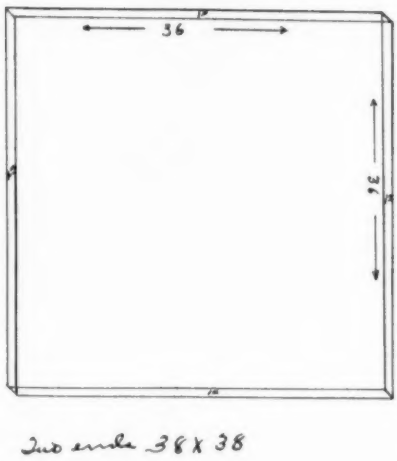
No. 3.—The Boss, filling honey direct from storage tank. Hot honey from warming unit, (No. 1) is pumped here and strained thoroughly. Then settled before running off.

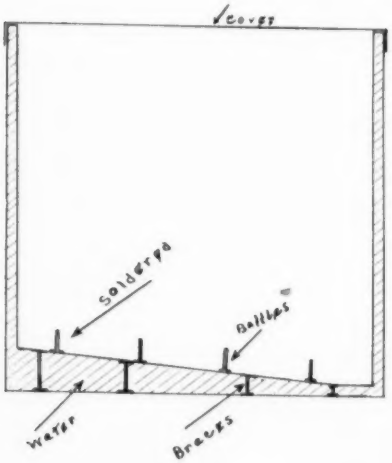


No. 4.—Gasoline and water tanks, with hook up for auxiliary air pump at the back. Note pressure switch on top of water supply tank.

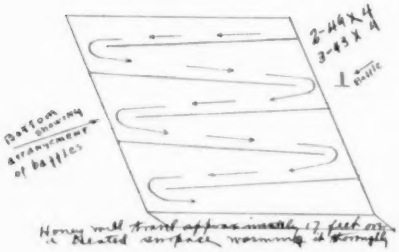


Six diagrams to show construction of the warming unit. This one shows outside tank.

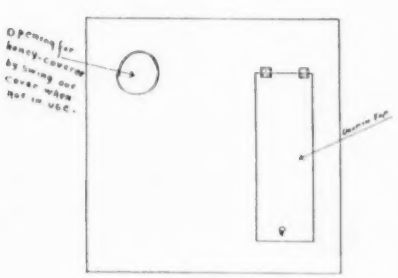




Inside tank, supports, and baffle walls.



Arrangement of baffle walls at tank bottom.



Cover of tank.

the air, and the finished product is bottled directly from the storage tank perfectly clear and without foam.

Gasoline and Water Tanks.

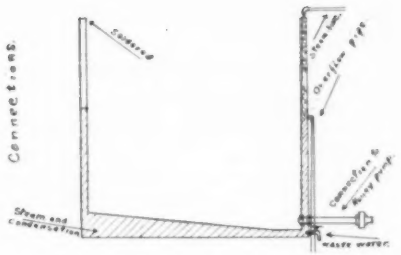
Picture No. 4 shows the gasoline and water tanks with a hookup for the auxiliary air pump in the rear of the tanks and the pressure switch on top of the water supply tank. Air pressure is necessary on the water and gas in order to force the gas to the burner that fires the boiler and to force water through the float valve control as steam is used up.

When the pressure drops to 20 pounds, the pressure switch kicks in another ¼ horsepower motor which operates a gear water pump (picture No. 5) which pumps water into the supply tank, raising the pressure to 40 pounds and then automatically kicks out. The air safety valve on the water tank is set to blow at 45 pounds. The pop-off on the steam boiler at 20 pounds.

Power to run the shafting is produced from a ½ horsepower electric motor. The gas tank and burner may be bought from any manufacturer of water heaters for bath rooms. The boiler is the type used for heating steam irons, known as the Patrick boiler. The steam heated uncapping knife, cappings melter, extractor and storage tank may be purchased from any dealer in bee supplies. The water supply tank may be bought from any hardware dealer.

The warming unit is made from 16 gauge galvanized sheet iron, 36x108 inches, the ends 36x36 inches, edges overlapped and securely soldered. The lining is from sheet copper tinned and is 34x34x34x106 inches and the cover as illustrated.

This system works practically automatically. It is perfectly safe, requires little attention and one man in ten hours alone can extract and run into 60-pound cans, over 1000 pounds of honey ready for market, properly heated, properly blended and properly strained.



Connections from the warming unit.

The beekeeper using ordinary methods can care for not to exceed 200 colonies of bees, but with this system he can at least run 300 colonies and in a good season and a good location with proper care, he should produce 60,000 pounds of No. 1 fancy honey with his entire time and attention devoted to it.

More Ways Than One to Skin a Cat

Cary W. Hartman, Secretary of California Beekeepers' Association, in the December number of Bees & Honey, tells a good story about A. J. Kent, of the California Association. Mr. Kent secured a good crop of honey this year and was having difficulty to sell it but he announced that he would load his little Ford truck with honey, and take the road for Riverside, where the State Convention was to be held.

As the time drew near to start, he decided he would leave home without money. He found little trouble in exchanging honey for gas, and other expenses on the road. He showed up at the convention early the first day, registered and paid his membership fee in cash. He attended all the sessions and served on one of the most important committees. On his return home, he came to the office and gave a full account of his trip.

In addition to paying all the expenses with honey, he made other exchanges and arrived home with two gallons of paint for his beehives, five dozen eggs, a 20-pound turkey, two boxes of oranges, two boxes of persimmons, two boxes of sweet potatoes, 25 pounds of English walnuts. In addition he had $7.00 in cash which he handed to his wife saying:

"Buy the balance needed for a good Thanksgiving dinner, and ask a neighbor who is not so fortunate as we are to help eat it."

The best of the story is yet to come, for he sold the most of his Alameda County honey in Riverside, right in the heart of the County that produced 3,000,000 pounds of the finest honey the past season. No Riverside beekeeper can make a complaint of the price Mr. Kent received because it was higher than the best Riverside salesmen were getting for their fine orange and sage honey.

As I See the New Bee

By Dr. Lloyd R. Watson
New York

Last month, Dr. Watson told us his view of the faithful old bee of the past thousands of years. Here he gives us his idea of what the new bee might be like and then he tells us that we can really make it come true!

THE darkest hour in the long night of beekeeping is passed—the hour just before dawn. An extraordinary activity is clearly evident in a few very widely separated laboratories in the world. An auspicious warmth of color is appearing, and a new optimism in beekeeping is pressing upward toward the light.

It is well that this is so for even a beekeeper must live spiritually as well as physically. It is true enough that many a man and many a woman has won a living of honest bread and honey by catering to the wiles of "the old bee" for heaven knows it is old. Heaven also knows that the old bee is an autocrat, and there is no compromise, no middle ground, no reconciliation with an autocrat. The thing must go his way or not go at all. So while the beekeeper eats his bread and honey he may not so much feed his soul with the consciousness that he has been a designer, a master, a co-creator in his chosen profession, but rather when he boasts he may boast only that by strict and unremitting accommodation to the moods and fancies of his insects he has won this booty.

For millenniums before the centuries of which we have historical records wild bees were doubtless game for the hunter who thus supplied provisions for his household. The nature of certain species of wild bees made then amenable to some degree of human control. When brot under such control they assumed a greater importance but always subsidiary to the growing of crops and the breeding of larger animals.

A curious position, indeed, it is that the honeybee occupies in the romance of emergent man. In times not so remote we are told that the occupation of beekeeping was surrounded by an atmosphere of witchery and enchantment, so noncommunicative and incomprehensible were the bees. Their independent disposition and their pitiless resentment of the advances of friend or foe alike gave to them the awe of most creatures. The comparatively few men and women who by temperament and experience were able to manipulate the bees for their own advantage were derided, maligned and shunned. The day of that has passsed forever by virtue of a change in the attitude of man, but not by virtue of any change in the bee. We see how that bees and people have ever been closely associated, and as the latter have moved forward to the frontiers of civilization they have carried with them the precious but untamed bee. Her services to agriculture are truly benign, and the gleanings of her flight are sweet, and one is constrained to remark how little she lacks of being a dear, or perhaps, rather, how much she lacks.

From the very irony of the case the recurrent question is asked—what shall the new bee resemble and what shall be her distinguishing marks? Scientists on the borderland of research are calling back to us thru their megaphones and are telling us that the laboratory for honeybee genetics is now open for work, and it is time for the intelligent, forward-looking bee folks to study and communicate with one another, and design the new bee which they would delight to work with exactly as dairymen, and horsemen and swinemen have so notably done and are still doing regarding the stock they choose to work with.

There is no longer any room for doubt that honeybees conform to the same laws of Mendelian inheritance as do other bisexual organisms, and now that the mating of the queenbee is under absolute control in the laboratory, the question may fairly be asked, what may we not expect to see before the close of the present generation. In seeking an answer to this question let it be recalled that the basic principles of our modern scientific experiments are not really new. It is only their application to the breeding of bees that is new. We may have, therefore, to guide and to inspire our studies in bee-breeding the accumulated and accumulating experience of the breeders of all the other animals which man has reduced to captivity and modified to suit his conveniences.

The time is ripe for the development of drastically improved types of honeybees. The materials and the methods are in easy command, and revelations, almost consternation, are in the future for beekeeping. It seems highly probable that a decade hence we shall be thinking thots and dreaming dreams which have as yet scarcely entered our conscious thot.

It is inevitable that beekeeping terminology will change as has that of about every other agricultural profession in the past decade or two. The names Italian, Caucasian, Carniolan, and the like will in time be used only in historical references, as the names of Black Java, and Dominique in poultry language are now used. The name foulbrood will recall unpleasant recollections of a once dreaded bee disease, and smokers and bee-veils will be seen only in museums or among unprogressives who cling to the wild bee.

Certain perversities and deficiencies of "the old bee" constitute handicaps which have tormented beekeepers thru all time. Notably among these must be mentioned, (1) the all but universal propensity to divide the working force of the hive by swarming, (2) the inordinate and usually inexcusable use of the sting, (3) the inherent inability to resist brood diseases, and internal enemies such as waxmoths and ants, (4) small size of body and frailty of wing, (5) proneness to pillage and rob neighboring colonies during a dearth of nectar, (6) tongue-length entirely inadequate to permit the bee to pollinate red clover and probably other flowers aplenty, and incidently to conserve a vast treasure of excellent nectar now almost totally wasted, (7) proneness to become nervous and to abandon brood-nest activities when the hive is opened for manipulation.

These and many other holdovers of primitive bee nature some of which contributed enormously to the ability of the insect to survive in the earlier struggle for existance, are now no longer needed in the environment of domestication, and like horns on a modern milch cow, and tusks on a modern meat producing hog, and like

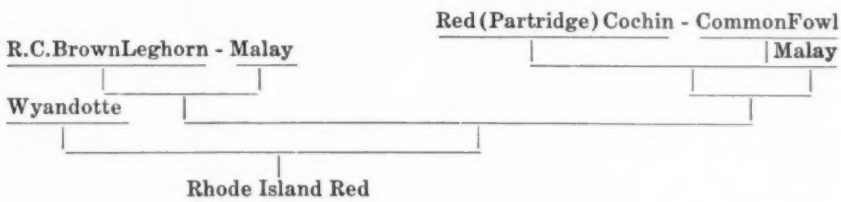
spurs on a Plymouth Rock mother hen, they are to be scored against the credit of the possessor rather than in her favor. At every conscious opportunity the honeybee geneticist will employ his art to crowd the factors for these hereditary nuisances off the chromosome map forever, and with equal zeal and watchfulness he will seize upon every conscious opportunity to conserve and fix even the slightest mutation or heritable deviation from type in the direction of larger body, stronger wing, gentler disposition, superior physical health, longer tongue, more capacious carrying stomach, more beautiful markings, and the like.

In the application of the breeder's art to the improvement of bees, as in any other organism either animal or vegetable, the possibility of effecting change in a desired direction rests with those heritable characters which vary in intensity from one individual to another in the same species. Every one of the characters mentioned above is known to be possessed in varying degrees by different strains of bees. It is, therefore, perfectly obvious that the principles of inbreeding and selection which have been used with such marvelous effects upon other organisms are equally applicable to honeybees. It would be absurd to deny that difficulties will be encountered in manipulating and measuring some of these characters. It must not, however, be forgotten that difficulties constitute a challenge that is forever with us, and that the scientist is born to the chivalry of accepting the challenge.

The opportunity for the development of new types of bees and the materials at our disposal from which to draw for a beginning present a striking parallelism to those employed by our poultry friends in the development of their present amazing wealth of useful and beautiful fowls. There is every reason to believe that nature will be ust as responsive to efforts in bee breeding as she has been to efforts in poultry breeding. The poultryman has the obvious advantage in that he can control the mating of his fowls so simply whereas the mating of the bees must, for the present at least, be carried out in a laboratory. However, the beekeeper can claim another sort of advantage over the poultryman in that his cultures are definitely parthenogenic.

We are now at last face to face with the problem really of breeding and domesticating honeybees, and the question is naturally raised, will bees submit to this process without great loss of constitutional vigor? It is a conspicuous compliment to the adaptability of poultry that there has been so slight a loss of functional activity as a result of the artificiality of domestication. In their wild life fowls had to seek for all their foods and as a result the muscles and organs of their bodies were constantly exercised. When brot under the control of man, and especially under intensive methods of culture, all this was changed. With all or nearly all food supplied and when confined in small yards there was great danger of reduced vigor by sheer inactivity. Not so with the bees. Neither their flight range nor their physical activity inside the hive or outside the hive will ever be restricted as the result of domestication. On the contrary quite the reverse condition will occur. Longer flights, greater bodily activity, and heavier loads will ever be required of the new bee.

A single example again drawn from poultry lore will illustrate a procedure which will be used freely in developing and fixing special characters in bees. It will be recalled that the Rhode Island hen is strictly a man made fowl, and was created, step by step, in accordance with the following scheme:



Each one of the parental birds in this scheme contributed to the composition of the Rhode Island Red hen. Any poultryman can tell us that Brown Leghorns, and sometimes common fowls, lay white eggs, but the Rhode Island Red lays a brown egg due to a dominant factor for brown egg handed down to her from her Malay, Cochin and Wyandotte ancestors. The Malay ancestors also contributed among other things the quality of pugnacity and self-defense, a character we are told which is so desirable in mother hens in country ranges where hawks and crows make frequent visits to take chickens. The Cochin and Wyandotte also contributed the heavy feathering which so admirably fits the Rhode Island Red fowl for cold climates.

Without tracing further the hereditary relationships of this pedigree let us propose an analogous hypothetical pedigree by erasing the names of the fowls from the above scheme and substituting in their places names of races of bees. An initial difficulty instantly presents itself. There is no authoritative standard of perfection for any race of bees, such as exists for most important strains of fowls. The creation of a standard of perfection for breeds of bees by a competent and properly authorized scientific body is a problem of first magnitude.

It is perfectly evident that the new bee will not be created in a day, nor that all the characters that the new bee must carry will be fixed at one time or by a single expert working alone. Such a task would be beyond the possibilities of a lifetime of work. On the other hand the creation of the new bee demands the enthusiastic cooperation of many persons with many types of training, talent and skill.

Unmistakably we are on the verge of new revelations which may alter entirely our conception of apiculture. Any lover of biological science and of bees may find here a field worthy of the devotion of a lifetime. Here he may find opportunity for the exercise of the most expert skill and the most highly disciplined patience. But in espousing the cause of "the new bee" let him first be committed to the thesis that while the workman may fail the work shall go on, because for the man of science there is no end, and no horizon.

Leather Colored Italians Preferred

My experience so far with golden Italians is that they are not quite as good as the mixed between golden and darker. [Leather colored.—Ed.] Like I was telling our inspector who seemed interested in the golden, if he wanted honey, hold to the darker Italians.

Out of four years of beekeeping, this is the first winter I have had drones all winter unless it was from a colony with a queen becoming unfertile. My bees are extra strong and should we have a good spring they may give me trouble in swarming. So far rainfall has been very light here and we will be lucky if we do not have a shortage of irrigation water.

My bees did well last year. Out of 31 colonies I extracted more than 1¾ tons of honey. Am all sold out and could have sold more if I had had it. Honey here is light amber, mostly alfalfa.

Some beekeepers in my opinion want too much for their honey under present conditions, and I believe they hurt prospective customers. It is a good time to create an appetite for honey so that when prices are fair your steady customers will have been established.

Joseph Ferreira, California.

Rearing Your Own Queens

By Jay Smith
Indiana

Few beekeepers do raise their own queens and few really know how important the queen is in the economy of honey production, or in the well being of the colony. When once the effect is seen, then the eagerness for queens will make a great demand and every queen breeder welcomes that tide of interest.

Influence of Food on the Queen.

NO other being in the animal kingdom is more dependent on food for its normal development than the queen bee. The difference between a queen and a worker is merely a matter of food. If the larva has an abundance of bee milk during its growth a normal queen is the result. Any amount less results in the queen taking on more or less the character of the worker. Less food means smaller queens with less egg tubes, subject to early supersedure and less egg production.

I have seen bees that evidently got too much bee milk for a worker and not enough for a queen. Such a bee had a worker head and thorax, but the abdomen was the shape and color of the queen. Such bees did not interfere with a cell or another queen. Bees receiving more bee milk would not tolerate a cell but were not developed sufficiently to mate and would be lost at mating time. Those better fed would mate and maybe fall to the ground and be unable to return or would get into the wrong hive and be killed. Those still better fed would lay a while and be superseded and so on up to the fully developed normal queen.

Some will say that this is mere theory and ask "What is the fact?" **The fact is that all of us are rearing too many poor queens.** We hear complaints from all quarters of queens being superseded the first season when shipped in packages or sent in the mailing cage. Many such queens are reared before weather conditions are favorable for best results. When I get complaints about supersedure they are invariably from queens reared when conditions were not the best for queen rearing and the larvae did not get sufficient food.

Some claim that disturbing a colony after a queen has been introduced will cause the queen to be balled. I have heard this for many years and have often wondered just where they get that any way. I have introduced many thousands of queens and the system of introduction that I have found gives best results, calls for "disturbing" the colony as soon as the queen should be laying nicely and if, in all these years, I have ever lost a single queen from disturbing the colony I do not know it.

This past season under my personal supervision we introduced as nearly as I can judge 700 queens. We put in the queen and in four days let her out of the cage. In four days more we examined the hive to see if she was laying nicely. Not a queen was injured as far as I can see by this examination. As we clip all queens the supersedure would be detected later in the season when we examine for winter. Not half a dozen were superseded and these were some that were reared at the close of the honey flow when the conditions were unfavorable.

It is a noticeable thing that the queens that were reared when the queen laid directly in the queen cell, during my experiments, have all been long lived queens. Some laid in queen cells and in others I got the queen to lay worker eggs in drone cells which were then placed in a vertical position and finished as queens. None of these were ever superseded as we replace all after the third year.

Rearing Your Own Queens.

For the honey producer I do not recommend the grafting method. Whether you graft or not, the first steps are the same. First set an empty hive just behind the hive containing your breeding queen. Next remove all brood from the breeding hive, putting it in the hive to the rear. Shake in about half the bees from the brood into the old hive. Also put the queen into the old hive. Put two frames of new comb into the hive on the old stand that now contains the queen and two or three pounds of bees. If no honey is coming in feed sugar syrup. Allow the queen to lay for one day and then pick her up by the wings and drop her back with her brood in the other hive to the rear. Feed the colony well that has the two combs with eggs in them and they will build a nice lot of cells.

If you want more cells and larger ones shake in bees from other colonies, the more the better. As the eggs were all laid in one day the cells will all hatch in one day so you can tell when to cut them out.

After the cells are capped over, if you do not care to rear more immediately, the hive is set aside, the hive with queen and brood is set back on its original stand, a queen excluder is put on and the hive with cells set on top of that. Place two combs of brood in the top hive to keep bees up there to care for the cells. In seven days after the cells are capped they should be cut out and given to colonies to be requeened. As good queens can be reared in this way as during the swarming impulse.

Our Present Method of Cell Building.

We have been using a method of cell building that is different from anything I have ever heard of and it has given such excellent results that we expect to use it exclusively in the future whether we use the grafting method or not.

Three empty hives are placed in a row about six feet apart. Two combs with a little honey are put in each and a division board feeder put in each hive. Till stocked with bees of course the entrances must be closed to keep out robbers.

When ready to graft one package of bees is brought up from the outyard. This package contains fifteen pounds of bees. This package is dumped into the first hive in the evening. The feeder is filled. Next morning one bar of 50 cells is given, the bar being placed in the top position in the frame as the bees will do better work there. Next day the same is done to the second hive and next day to the third.

On the third day the cells in the first hive are nearly sealed. We then make up a package of about six pounds of bees from the same yard in which we are rearing queens. We do not take more than half the bees from any hive as it would check brood rearing. This package of bees is dumped in cell building colony No. 1. In half an hour after giving the bees, a bar of 50 grafted cells is given. The bar of capped cells at the top is moved down one place and the new bar given at the top. Remember that all three hives must be kept well fed all the time.

Next day do the same with the next hive and so on each day, always moving the finished cells down one place and giving the new cells at the top.

On the ninth day we will have three bars of finished cells in all three hives and we are ready to give the first hive a frame of grafted cells. The first one we put in nine days before is now on the bottom position

where the bees will not build comb on it so badly. The cells must now be removed as they are ripe, so this bar is taken out and the cells given to mating hives, the two above moved down one position and more bees added and another bar of grafted cells given.

This process is kept up throughout the season. The only objection to this system is that, as we graft one bar each day this grafting of one bar, adding the bees and introducing the cells from one bar must be done on Sunday. However, this is only about one hour's work so we do not mind it.

If three are working, one puts in the bees, another introduces the cells and the other grafts, so only a few minutes are taken. In case more cells each day are needed than one bar, two frames are put in the hives and two bars grafted each day and eight or ten pounds of bees added each day. Three bars could be given in three frames each day if enough bees were added but we have never used that many. It might be necessary to give them an extra story.

When a flow is on and the bees build combs, the hive is filled out with sheets of foundation or starters. When they are filled the frames are taken out and given to other colonies or the feed can be extracted and fed back to them again but we always have found use for the extra frames in making increase or for giving to colonies short of stores.

Three Colonies Build Thousands of Cells.

These three colonies will furnish abundant cells for a thousand mating hives. It may seem unbelievable to those who have been using other methods but it is true. And what is more this large number of bees kept in one hive with plenty of feed will build better cells with better fed larvae than any system I know of and I have tried most everything.

There is no set rule as to how many bees should be added each time a bar of cells is given, but if the colony is started off with fifteen pounds of bees it must be given enough each time a bar of cells is given to keep up that number. We should remember that at least half of the bees we give each time after the first will return to their own hives. But they stay 'til the cells are well finished. All real young bees stay. The bees given are largely nurse bees and are taken from hives with plenty of unsealed brood. The old bees remaining in the hives with the cells are many nurse bees as they have cells to build all the time, therefore they remain nurses. With this large number and the new ones added, the colony is in perfect condition to build the finest cells. Enough bees are added each time to make up for the death rate of the colony. When conditions are unfavorable for cell building, more bees are added to off-set this. Keep enough bees in each hive to feed the larvae abundantly. Fifteen pounds will build fifty cells and feed the larvae as well as more can. Twenty-five pounds will build one hundred cells. It would probably take eight pounds every third day to keep up the strength of twenty-five pounds. One will have to judge by the appearance of the bees and add as many as he thinks they need.

This system can be run in this manner all through the season. As young bees are added and as the bees have larvae to feed, no laying workers will develop. If twenty-five pounds of bees are used and a honey flow is on, no feeding should be done and a super for extracted honey will have to be given. A comb honey super would crowd them so badly that they would build comb all over the cells and mess things up generally. We put two rows of cells on each bar to take up the extra room so the bees will not build comb on the cells.

Bowker's Review of Michigan

Horace Bowker, President of American Agricultural Chemical Company, in a recent report, pointed out that Michigan produces everything needful for satisfactory existence except cotton. It is the third largest producer of grapes, fourth in strawberries and canteloupes, fifth in onions and rice, sixth in potatoes and buckwheat, seventh in beans, peas and pears; eighth in sugar beets, tenth in oats, tomatoes and asparagus. (Sixth or seventh in honey production.—Ed.)

"And yet," said Mr. Bowker, "so far as the rest of the country knows, one would think Michigan produced nothing but automobiles."

While Michigan is one of the bright spots in the national agricultural outlook, it is pointed out that "last year the average net income of the American farmer declined to $211. That was what the farmer had left for himself and his family after paying his operating expenses, wages, interest and taxes. That was his return on his investment, his management and his labor. Farm wages last year averaged $339. So the farmer was $128 worse off than his hired man."

The crux of the farm problem is expressed in the fact that the exchange value of agricultural products is out of line according to Mr. Bowker. Thus in December 1932 it took exactly $2.00 worth of farm products to pay for $1.00 worth of commodity bought by the farmer. The explanation is in the increasing surpluses which have been accumulated. The failure of supply to adjust itself to demands is due both to the character of agriculture and to war stimulation of acreage expansion.

I Find Too Much Room in 2-Story Hives for Wintering

Bees wintered in two-story hives, at least with me, often cluster in the top story and may not break the cluster in time to prevent robbing from below. This has occurred too frequently to meet my approval. I have found hives entirely—well in exactly the condition of many of our banks, "just loaned out."

So I have not found the food chamber as satisfactory as might be desired. There is too much room in the hive, too much open space to be kept warm, too much territory to permit the gangsters to assemble and rob out the un-occupied combs while perhaps the bees in the hive may be clustered in a remote part.

This condition occurs especially where the hive is in a shaded location and protected from the warm sun. Gangsters may come from a hive which is in the sunshine and so ready for a foraging trip.

When I use the "Food chamber" I prefer to place a honey board, without the escape tin, above the brood nest with the hive body of honey on top. The bees slowly take the honey out of the top story as they need it and the cluster remains below the board so we get the same benefit as we would by having the doors closed on a wintery night. We use an opening into the top of a single bee space to permit only a few bees to get access to the honey at a time and also to allow a limited amount of moisture to leave the hive while not carrying away all the warmth from the lower body.

J. H. Sturdevant, Nebraska.

[The fault you find is what makes us prefer a deeper hive like the Dadant brood chamber to a two-story hive.—Editor.]

More Comb Honey; Reasons

Every producer should produce some comb honey. On the whole, the production of well graded market comb honey has decreased to too great an extent.

There are several good reasons why beekeepers should at least have 20 per cent of their colonies run for comb honey. First, it increases the market. The grocer readily displays comb honey because it is perishable and will, therefore, display extracted honey with it and moves both the extracted and the comb. Second, it increases the profits of the beekeeper because it is more easy to sell locally at a better price. Third, in producing comb honey, it is much more easy to control disease. Fourth, it cuts down the production of extracted honey of which there is too large a proportion at the present time.

A. L. Worthington, Iowa.

Making a Business of Pollination

By Walter H. Hull
Virginia

Suggestions to the Beekeeper

THE only reason a beekeeper has for putting bees into commercial orchards is the money he gets for it. Naturally the more orchards he can serve the more money there will be coming to him. By taking advantage of different opening dates of the bloom for different varieties of fruit and the variations in latitude and elevation it is possible to make one lot of bees serve a number of orchards.

My experience in this direction is confined to the past two seasons and to orchards under a single management. The returns are smaller, of course, in such a case than they would be where contracts were made with several independent orchards, since the growers will demand a lower rate for three orchards than they could get for one. But in serving several independent orchards there might be some difficulty in making connections, as the blooming period will overlap more or less.

Before venturing into that phase of the business the beekeeper should have a suitable truck for moving the bees so that there will be no delay on that score. When the orchardist furnishes the truck there are apt to be delays, not at all unreasonable from his point of view, but nevertheless serious for you when you have a fast schedule to make. A truck for this work should have at least a 12-foot body of standard (6-foot) width. A 16-foot body would carry more bees but might be hard to navigate through the orchard. However, the bees could be unloaded onto wagons and distributed through the orchard in that manner if necessary, as they must be in some cases anyway. This advice in regard to truck ownership applies only if you are going after the multiple orchard work. When the bees are placed in only one orchard about the only advantage in moving them on your own truck would be that you could get a higher rate for the job. However, if the orchard is more than fifty miles away the cost of your own transportation from and to it when the orchard truck is used might also be worth considering.

In my case, with the orchards all under one management, there was no trouble in regard to connections, even when using the company truck. All I had to do was get the bees ready to move at a specified time—and move them when the truck arrived. Generally it was prompt, but not always. On one occasion the bees were confined too long for their own good as a result of delays. Another time I missed three hours of sleep that I needed and might otherwise have caught. I growled a good deal about the hardship and tribulation, probably more than I should. Still, a man is entitled to a certain amount of growling as his natural right, although of course a wise man will make scant use of the privilege.

We moved first to a peach orchard. Peaches bloomed this year early in April, and from that time until after the middle of May the bees were away from home. Not only that, but they were scattered about in such manner that any feeding, supering or other care could be given only with difficulty and at abnormal expense.

Peach bloom yielded nothing. After watching two weeks more of cold, windy weather go by I loaded some jars of syrup into the car and drove to the orchard. It proved a simple enough matter to make the rounds that day, heft each hive as I came to it and stick feeders into the entrances of any that were too light. The only extra expenses were a day's time and the cost of a 200-mile trip.

But as it happened, apples yielded heavily in the first orchard that the bees were moved to, after peaches were gone. I knew before the blooming season was half over that those hives were likely to need supers; and continued fair weather confirmed this belief. I began to figure. By getting up at three o'clock I could reach the orchard by seven. That would leave a full day for doing the work—time enough, provided the hives could be located without too much trouble. But I was not at all sure that they could be.

In supering hives in an orchard you must drive over the whole course with a loaded truck in order to have the supers at hand when you want them. Orchards vary in accessibility. A few might be rated good. A great many rank merely bad, with a lot of them worse. In getting about with a truck you flounder through as best you can, charging up the steep slopes with everything wide open, slithering down them with brakes set—and preferably eyes shut, since the truck will take its own course, steer it how you will. You plow through wet sloughs and hurdle drain furrows.

With these things in mind the net result of my figuring was that I decided to let those hives go without supers until they got home. It was not a good thing for the bees and I paid well for it in a shortened honey crop later in the season.

To avoid these troubles as far as possible colonies should be uniform in strength when they go out and **not too strong**. That statement may raise a kick, but I stand by it. The time may come when orchardists are willing—and able—to pay for putting rousing big colonies into their orchards but that time is not now. If we are not going to do it we may as well be honest and tell them so. Five

frames of brood is a good standard to go by. Such a colony is strong enough to do effective work, which after all is what the orchardist wants. At the same time it is small enough to be moved at reasonable cost, and will not require too much attention while away from the home yard. Most orchardists are satisfied with colonies that have from four to five frames of brood and attendant bees.

For colonies short of that strength, put in a generous pound of package bees for each frame of brood short of five. Three-pound packages, the most economical to buy, may be split when necessary by dumping some of the bees into another cage.

If you are using two-story hives leave them so. Otherwise it is desirable to use a food chamber over the brood nest, with honey enough to last through the period that the bees are to be away, but not much more, since that comb space may be needed if fruit bloom happens to yield and supering bees in the orchard is a profitless task at best. Swarm control work is equally obnoxious, so young queens and good comb should be the order of the day.

There is a wide-spread belief among beekeepers that putting bees in orchards for pollination work interfers with the honey crop. I think that belief arises from the fact that the best colonies are the ones most likely to suffer from such a move, and frequently do suffer; and I think the producer's attitude is justified by that fact. At any rate some of the best producers I know, particularly those specializing in section honey, will have nothing to do with orchard work. It is a fine problem to bring an apiary up to the honeyflow in just the right condition and at just the right time. Moving to the orchards, with its attendant risk of loss or set-back, involving probably a more or less serious drain on the bees' vitality, does interfere with this delicate task and is apt to upset the fine balance that must be maintained in order to accomplish the desired result.

With such a sea of blossoms how can the poor native pollen carriers do the job? The honeybee is the only answer to the need.

The honey specialists are right. Orchard work is for those who do not make a fine art of honey production; who are in fact merely skimming the surface of that field, taking what they can get from it in passing and depending on orchard work to make up the deficit.

Whether that is a good plan or not will depend on the individual and his particular circumstances. He may lack the qualities that go into the make-up of a good honey producer; or he may have a bad location for honey. Or again, he may be hard up and in need of money, a condition not entirely unknown among beekeepers. Whatever the pros and cons, the question in every case is one that each must decide for himself.

Colonies carried into the orchards in trucks, can then be transferred to wagons for distribution through the rows.

Using Sulphuric Acid

In your October number on page 408 is an article "Danger in Use of Sulphuric Acid." I want to tell anyone who wishes to use sulphuric acid how it may be used safely.

First, always handle sulphuric acid near a generous supply of water. Then if it is spilled on the person or the clothes an immediate immersion in water will save one from being burned as it washes off readily. However, the action of the acid is very rapid and it will burn the flesh quickly and deeply if it is not immediately removed with plenty of clean water.

Now, when diluting, always pour the required amount of acid into the required amount of water and pour it slowly as uniting the two generates heat and the acid if poured too fast will cause the water to boil and sputter. There is also danger of the crock breaking with the excess heat if the water and the acid are united too fast.

If the solution becomes too hot, hotter than you can bear your hand on the vessel, stop pouring acid and wait until the solution cools off before adding the remainder.

Mix your solution in a stone jar or crock or a glass dish. If you do not have a crock and must use glass, you will have to add the acid very slowly; stop pouring as soon as the glass gets warm and allow it to cool before adding more acid.

This is the way we handle sulphuric acid in the laboratory where I am a chemist. Beekeeping is my pleasure and if this knowledge will help, I'll be pleased.

Paul Yaple, Ohio.

IT was my intention to have a wonderful time summarizing the bee flights again this month, as February and the last half of January are usually cold, but flight days have been so numerous that it is of little use to record them. The bees have been gathering water and on one day I actually saw them carrying in pollen. It must have been from soft maple although I have not seen any in bloom. This is the third mild winter. I actually believe that bees unpacked have consumed less stores and taken less frequent, yet sufficient flights than bees better protected. (Later—February 7—Blizzard. Snow foot deep—3 below zero—Still later 12 below zero.)

— : —

Apparently Corkins in his articles in Oct., Nov., Dec. and Jan. has come pretty close to explaining winter behavior as far as we were able to judge it from practice. I was particularly interested in the report of J. D. Beals of Dwight, North Dakota who was visiting us last week. In that country you know wintering has usually meant the use of a cellar or a cave. It gets cold there, 20 to 30 degrees below, sometimes lower than that, and yet, for a number of years, Beals has been wintering bees outdoors in sheltered locations; double story hives with tar paper wraps, using any convenient packing material for a couple of inches between the paper and the hive. He reports splendid results and that his bees consume less stores than bees wintered in the cellar. I believe that we have overemphasized the need for packing and laid too little stress on the desirability of general protection.

— : —

Remember "A step in time save nine" (pardon the substitution). One hive in which bees have died in winter, removed now to the honeyhouse or basement for examination, may save several cases of foulbrood later. During any of these warm flight days, be sure to look the bees over to see if there are any hives without bees; colonies dead from any cause at all. Get them out of the yard so bees cannot rob them and remove what is remaining. They may take disease along with the honey.

When you get the hive inside, look over the combs to see if they are safe to use. It's a good time to cull out the bad combs and put all the good combs in one hive or leave a space to be filled up with foundation later.

— : —

My side kick, Kirlin, moved a whole apiary the other day a distance of about half a mile. This was in winter too and had to be done on a fairly cold day in order to get over the roads in a car. No particular precautions were taken. Just closed the entrances, loaded them on and moved. Set them down in their new place and as far as can be told, there was no drifting back. The colonies are in excellent condition.

One thing was done to make the bees notice the change. Boards or similar convenient strips of material were leaned up against the entrances, so, when the first flight day came, the bees might notice the unusual obstruction and so possibly mark the location a little better.

— : —

Moving the bees also gave an excellent chance to choose good shade and to secure a water supply, both of which are essential in any location. I am coming to believe too that it is a mistake to lay the apiary out in long, straight rows, all hives looking more or less alike. Hives placed hit or miss fashion, in sheltered spots where there is some brush or shrubbery, perhaps even some broken ground, might result in fewer losses of queens in supersedure, swarming, requeening or otherwise.

— : —

A most interesting thing happened to me the other day. I had a nice letter from J. B. Merwin of Prattsville, New York, in which he said he was sending me a package by mail. In 1914 I worked for Merwin, my first commercial beekeeping venture, although bees had been in the family since I was a small boy. Merwin, however, had several hundred colonies. I was actually able to help him and that was a glorious feeling. But it's another story.

The thing of interest was my apiary notebook of that long past date which brought to memory the fact that at that time J. B. was about my present age (42) and I was 24. His son, Charles, at present in business with him, was about 20 then. Now J. B. is in shady fifties. Time certainly has a way of passing, doesn't it?

By G. H. Cale.

THE EDITOR'S ANSWERS

When stamp is enclosed, the editor will answer questions by mail. Since we have far more questions than we can print in the space available, several months sometimes elapse before answers appear.

REMEDY FOR PARALYSIS

You printed a remedy for bee paralysis using two kinds of salt, in 1928 or 1929 of the American Bee Journal. I left it in Vermont. I wish you would print it again as the disease is prevalent here. The cause is constipation, but that is not caused by poor honey or being confined. CALIFORNIA.

Answer—I can find only one article on this subject in the two years you mention. It is the article by Dr. Lardinois, published in the June and July numbers of A. B. J. 1928.

In this scientific article, he advises the use of about 40 drops of formic acid to the gallon of sugar syrup fed to the bees. He says also that "sea salt in a very small proportion would also help to supply some of the mineral salts necessary to their life."

There is no doubt that what we call bee paralysis, also called constipation, May disease, maikrenkhait; indicates the same disease and appears mainly in the Spring. Usually feeding sugar syrup helps to pass it off. But the remedies added by Dr. Lardinois evidently help the digestion of the sweet mentioned.

SPRING QUESTIONS

1. I have often wondered if brood is not done considerable harm when frames are lifted out of the hive for examination in the spring, when the temperature is about sixty degrees? About how much exposure can unsealed larva or eggs stand without harming it?

2. Having had considerable trouble with bees eating thru and tearing down well wired, seven sheets to the pound, standard foundation. I would like to know if it would help any to use five sheet to the pound foundation? I have plenty of wax and could keep it this way until the market is better.

3. Will the bees accept foundation as heavy as this?

4. Why is newspaper always recommended for uniting? Doesn't the dye harm the bees some when they tear it down?

WASHINGTON.

Answer—1. I have never noticed any harm done to brood by lifting it out of the hive in cool weather. Of course, we do not leave it out long. There is no need of doing this, except in queen rearing and then only a few combs are lifted.

2. We use altogether six sheets to the pound wired sheets and never have had any trouble.

3. Of course bees accept foundation of any weight but they thin it out always to what they think a proper condition.

4. Newspaper is used in uniting because it depays the bees a little while in getting together and keeps them from rushing into a fight.

MOULDY COMBS

1. What is the cause of sealed honey moulding on the hive?

2. What can be done to save the drawn combs, honey is granulated in these combs?
TEXAS.

Answer—1. We never have combs to mould on the hive unless the bees do not have enough ventilation. But down in Texas, there ought to be enough chance for ventilation to keep the combs of honey from becoming mouldy.

2. If your honey is granulated in the combs, there is but little chance to extract it. Feed it to starving colonies that need honey to breed.

MOVING

I am moving my bees about eight miles in the Spring, as soon as weather conditions permit to take them out of cellar. They are all in ten-frame two-story hives. Would like your opinion and advice on how to prepare and move them. WISCONSIN.

Answer—It will be all right to take your bees out of the cellar and place them on their summer stand. Then you can move them at any time which is convenient. It would not do very well to carry them that eight miles right out of the cellar.

Be sure and keep them in until the weather is warm enough till they can fly as soon as released.

COLONIES PER ACRE OF CLOVER

How many average hives of bees could I keep on 25 acres of sweet clover, clover being the principal honey plant here?
OKLAHOMA.

Answer—You cannot keep very many hives of bees on 25 acres of sweet clover. But if sweet clover grows in your vicinity, there is no reason why it should be confined to 25 acres. It is an excellent plant to enrich the soil and if you take interest in it, you could readily succeed in getting thousands of acres to grow in all the waste places in your vicinity.

There are plenty of spots where sweet clover is the only honey plant. Encourage it and you will soon have it all over the countryside.

PROPOLIS, MADE OR GATHERED?

My brother keeps bees and I'm writing a thousand word theme about them at school. So I'm really interested in them and should be thankful if you could explain something to me. My brother says he thinks bees make bee glue, but the encyclopedia gave, as a topic under industries of the hive, "Bringing in bee gum." I should like to know whether they make it, gather it, or what do they do? And also what is the correct name for it?

I am enclosing a stamp and shall appreciate your answer. IOWA.

Answer—The proper name for bee glue or bee gum is "propolis." This is composed of two Greek words meaning "before the city," because the propolis is gathered by the bees and piled about the entrance to keep enemies away. Propolis is gathered from the sap of some trees, such as cottonwood, willow, alder, chestnut. The bees bring it in during the dry summer season, just as they do bring the pollen of flowers, on their legs. They gather it where they think they can use it best and also employ it to close the crocks of the hive. It is much more used in hot countries than in our cool climates.

HONEY VINEGAR

In making honey vinegar made with washing and off falls, putting a little in the barrel through the summer at different times until Fall, making strong enough to float an egg. Will this be O. K. or must the barrel be full enough to overflow from the start. What I want to know is if it can be made this way.
KANSAS.

Answer—Vinegar may be made in any quantity, as you suggest, provided it is made strong enough.The egg in floating must just show itself at the top of the liquid with only the width of a dime showing at the top of the water. Sweeter than this would be too sweet.

The fermentation will be sure to come if you have some fruit juice mixed with the liquid. Or you may start the fermentation by putting a little vinegar already sour in the liquid. It takes several months to bring the liquid to proper sour condition.

from the Little Blue Kitchen

March Winds.

The March wind is a broom
With which Dame Nature plies
Until her world all spick and span
Beneath her keen glance lies.

And in the warm bee hives
Each honey seeker knows
'Twill soon be time for spreading wings
Since now the March wind blows.

And in each well-kept home
The nimble broom now sways,
The March wind blows; the missus knows
That means house-cleaning days.

Lida Keck-Wiggins.

WELL girls, Honey Lady has a little beauty hint to hand on to all of you who have extracted honey "and to spare." These days when folks are reverting in a good many lines to earlier ways of doing things, owing to lack of funds for all the new contraptions, we sometimes find that our mothers and even our grandmothers knew a thing or two about beauty aids. One of these struck Honey Lady "all of a heap." Being a good thing, she passes it on.

It's a honey beauty pack. This is how one "takes" it. Take 1 tablespoonful of strained honey and one tablespoonful of cow's cream. Mix thoroughly. Meantime cover hair entirely with a towel, or even better a rubber swimming cap, if one is handy. Then very carefully "pat" the preparation into the skin. It should remain not over ten minutes; eight is better, and these "treatments" should not be taken more than once a week, as the beauty expert Honey Lady consulted said they are quite severe. The honey pack "stimulates" the circulation; gives milady that clear lovely skin for which many of our dear grandmothers were so famous, and is a real Nature aid to beauty. Taken too often, however, my beauty expert warns, it will bring "lines." So go carefully.

While we're on the subject of saving money by home treatments for beauty, rub in a little honey at the nail bases each night and you'll find a much better looking cuticle line.

In the Blue Kitchen all winter has been a special little jar of honey, which is taken to bedsides frequently. Honey Lady was once subject to coughs. These still try to claim her bronchical tubes sometimes, but the moment the slightest little "bark" has appeared the past winter, she has reached for that honey jar; taken a teaspoonful of the lovely nectar and Mr. Cough has vamoosed every time. Honey Lady's husband has had the same experience. So now when March winds blow down delicate throats and they revolt, remember, every beekeeper's wife and daughter and son of you, that you've a true cough syrup right on your kitchen shelves; right in your honey combs. So that's the way to save some MORE dollars, or rather to get values without coin.

—o—

Do you like custard? Honey Lady has made many kinds and finds a dainty custard cup with a cookie or two makes a very acceptable dessert on raw March nights. She used to make up her recipes with cane sugar, but never now. Always instead she uses strained honey, and as a flavor finds almond extract fine. For any young cook who doesn't know EXACTLY how to stir up a custard here's Honey Lady's simple little directions, which will WORK 100%.

Honey-Almond Custard.

1 quart scalded milk.
4 to 6 eggs.
¾ cup strained honey.
¼ teaspoonful salt.
1 nutmeg.
1 teaspoonful Almond Extract.

Directions. Beat the eggs slightly, add the salt, then stir in the honey. Now add the hot milk slowly.

Pour into custard cups and sprinkle with a bit of nutmeg or cinnamon on top.

Set the cups in a pan of hot water. Bake in a moderate oven until a straw inserted in the custards comes out clean.

Do not let the water in pan boil.

You may add raisins to this mixture; or Maraschino cherries, or even a few well chopped nuts if something specially "fancy" is desired.

Meetings and Events

(Continued from page 81)

tary-Treasurer, C. L. Corkins, Cheyenne; County Directors—C. V. Woolsey, Wheatland; E. C. Judson, Orpha; C. H. Ranney, Lander; H. W. Trask, Casper; A. D. Hardy, Powell; John P. Rush, Newcastle; J. Earl Pritchard, Sheridan; Elias Johnson, Lovell; G. P. Callaham, Torrington; Frank St. Clair, Worland; Herbert Palmer, Thermopolis.

Objectives of the Association for 1933 are: (1) The securing of sufficient funds in the Legislature for efficient state apiary inspection. (2) Financial assistance to the American Honey Institute. (3) Affiliation and cooperation with the American Honey Producers' League.

Headquarters of the Association will be in the office of the Secretary, C. L. Corkins, 2020 Carey Avenue, Cheyenne, Wyoming.

C. L. Corkins, Wyoming.

Rhode Island Officers

At the annual meeting of the Rhode Island Beekeepers' Association held January 25, 1933, the following officers for the ensuing year were elected: President, C. P. Cornell, 198 S. Main St., Providence, R. I.; Secretary, R. P. Vaughn, Pontiac Road, Greenwood, R. I.; Treasurer, E. D. Anthong, Barrington, R. I.

Rhode Island has in addition five county associations all of whom act as vice-presidents and carry on the educational work.

The same three inspectors will be in charge as in previous years with Prof. A. E. Stene as Chief.

New Jersey Officers for 1933

The Association in New Jersey will have the following officers for 1933: President, G. S. Oettle, Metuchen; 1st Vice-President, C. L. Howk, East Orange; 2nd Vice-President, A. C. Faulkner, Basking Ridge; 3rd Vice-President, John I. Nelson, New Market; Secretary-Treasurer, E. G. Carr, Pennington.

Research Committee: R. S. Filmer, New Brunswick; Public Relations Committee: Paul Holcombe, Lambertville; Fairs and Standards Committee: James A. Taylor, Hightstown; Publicity Committee: Watson Allen, Bernardsville; Markets and Roadside Stands Committee: Corson Poley, Burlington.

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Either Cash or Trade Basis. Lowest Working Charges.

Wax traded for Cypress Hives, Bees & Queens

Write for big, free Catalog

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WALTER T. KELLEY HOUMA - - - - - - - LOUISIANA

DIAMOND Bright Italian Package Bees & Queens

	1-10	11-up
2-lb. with selected queen	$1.65	$1.60
3-lb. with selected queen	2.05	2.00
STANDARD NUCLEI		
3-frames brood with queen	2.20	2.15
4-frames brood with queen	2.60	2.55
Queens, "Diamond" select and laying	.45	.40

Special price on large quantities. Write us if you wish orders in special packages. Health certificate and hiving directions furnished. Service and quality guaranteed. Our queens are reared on honey through both natural honey flow and feeding.

GARON BEE COMPANY, Donaldsonville, Louisiana

NOTICE You are preparing to buy bees and queens. They are cheaper this year than ever. We do not know who is responsible for the low market. We do know that you have a right to demand just as much for your investment as when they were highest on record. For this reason demand the same quality as in the past. Through years of selection for high production and gentleness in handling we can offer you what you want and what you need. Our queens are produced on standard frames and on natural honey flow assuring you of a strong, vigorous queen to head your colony. **PUREST of ITALIAN STOCK.**

We guarantee you against loss and annoyance of delayed shipments. We believe we can please you in service and prices. Write us for particulars.

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PACKAGE BEES QUEENS

LOWER PRICES
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IXL Bassett's Italian Queens & Package Bees **IXL**

Queens are leather colored and produce three-banded bees.

PRICES:

Two-pound package with young laying queen $1.65
Three-pound package with young laying queen $2.00

Young Italian Queens, Fifty cents each. Liberal Discount given on quantity orders.

For description, see display ad. in January and February numbers of this journal.

We solicit Canadian business.

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HIGH QUALITY GOLDEN AND THREE-BANDED ITALIAN QUEENS AND PACKAGE BEES FOR SPRING 1933 AT REDUCED PRICES:

NUCLEUS PACKAGES

Shipped on Standard Hoffman frames of brood and honey and one young queen in each pkg.

2-Lb. Package—1 to 4, $2.00; 5 or more, $1.75 each
3-Lb. Package—1 to 4, $2.50; 5 or more, $2.25 each
4-Lb. Package—1 to 4, $3.00; 5 or more, $2.75 each
2-Frame Nucleus—1 to 4, $2.00; 5 or more, $1.75 each
3-Frame Nucleus—1 to 4, $2.50; 5 or more, $2.25 each

SPECIAL ORCHARD PACKAGE

A 2-Frame Nucleus with 5 additional pounds of bees and a young queen introduced, for $3.75 each, any number.

COMBLESS PACKAGES WITH QUEENS

2-Lb. Package—1 to 4, $2.00; 5 or more, $1.75 each
3-Lb. Package—1 to 4, $2.50; 5 or more, $2.25 each
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Packages without queens, 40 cents cheaper.

YOUNG QUEENS—1, 60c each; 5, 50c each; 10 or more, 40c each.

Prompt and efficient service, safe arrival guaranteed, and a health certificate with each shipment. Shipping season starts April 1st. Orders booked with 10 per cent down, balance at shipping time. Prices are F. O. B. shipping point. Address—

J. L. GASPARD, Hessmer, Louisiana

Jensen's Package Bees-Queens

"In time of Peace, prepare for War." Right now things are quiet; a good time to do some planning. The time for action will soon be at hand. We are already in action, and planning all the while HOW to give you even better packages, queens and SERVICE than you are accustomed to getting; regardless of PRICE. THE ANSWER IS: Perseverance plus Experience, plus improvement in Methods and Equipment. A sum total of EFFICIENCY.

PACKAGE PRICES:

2-Lb.	With Select 1933 Queens	3-Lb.
$1.90	1-10, each	$2.30
$1.80	11-25, each	$2.20
$1.70	26 - up, each	$2.10

If wanted without queens deduct 40c per package.

QUEENS

Select untested, via mail, in large airy cages. Guaranteed for a full season's service if introduction is successful. 50c each.

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Canadian customers please send remittances in Post-office Money Orders(not Postal Notes) or Cashier's Checks including Exchange. We can save you money on Express Charges because of our Geographical location. Investigate this.

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2½-lb. bees with select untested queen	$2.00
3-lb. bees with select untested queen	2.25
4-lb. bees with select untested queen	2.70
3-frame nucleus with untested queen	2.25
4-frame nucleus with untested queen	2.70
2-frame nucleus and queen with 2 extra pounds of bees	2.60
2-frame nucleus and queen with 3 extra pounds of bees	3.00
Select Untested Queen	.45

When you buy from us you get the best for your money and the advantage of our many years' experience, producing and shipping package bees and queens.

Our Guarantee:

Prompt Service, Quality and Satisfaction.

State Apiary Certificate with each shipment.

"ST. ROMAIN'S HONEY GIRL" APIARIES
HAMBURG, LOUISIANA

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Three-Band Italian Bees

IN COMBLESS PACKAGES

3-lb. Package without queen $1.60
With queen, $2.00 each.

25 per cent overweight shipped.

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The kind you'll love to work with—from true Caucasian breeding stock, purely mated.

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1-4	75c each
5-9	70c each
10-24	65c each
25-49	60c each
50-100	50c each

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CAUCASIANS

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Absolutely pure matings guaranteed. Replacements or refund. You are the judge. This is a gilt edge offer. We guarantee every queen to be a purely mated Caucasian from the best Russian stock.

PRICES:

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10-24	.80 each
25-49	.75 each
50-100	.60 each

PACKAGES

5-9	$2.90 each
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American Bee Journal, Hamilton, Illinois

PACKAGE BEES--QUEENS
Italian for 1933 Caucasian

All bred to the highest standards of perfection in our own interests as large honey producers. Let us show you that a large honey producer whose interests are identical to yours is better equipped to produce and ship the FINEST QUALITY BEES AND QUEENS.

A standard of quality that has earned CUSTOMER FAITH. That secured for us in 1932 the greatest volume of business in our history, and the position as California's largest shipper of fine queens.

Remember that a package of bees is no better than its queen. Our policy, "WE SHALL NEVER SHIP A QUEEN THAT WE WOULD NOT GLADLY USE IN OUR OWN HONEY PRODUCING COLONIES," is your greatest protection.

We expect 1933 to be one of our best years. Make it your best year by investing in **production insurance** with DAVIS BROS.' package bees and queens for 1933.

All packages shipped from Sacramento — the HUB of California's railway system. Fewer transfers, less delay, quicker service.

Transportation costs are less this year. Our prices are most reasonable. Write for quotations.

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OUR TOOLS APPEAL TO MODERN BEEKEEPERS TO CONTROL SWARMING

B. B. LOCK BAR for frames. Hive turned over without frames dropping out in swarming control. **B. B. SCRAPER** for quick, clean work for Queen Excluders, Honey Sections, etc. **B. B. PLIERS & HIVE TOOL COMBINED**, "The Beekeeper's Friend," most handy and practical tool on the market. Price of each of the above **$1.00**. All three by mail **$2.75** the set to manipulate our System of SWARMING CONTROL. **B. B. HOOK PLATES** for extending the alighting board, interchangeable to all hives. Price per dozen, **25c**. Our ready to swarm out colonies in 1930 controlled, averaged over 600 pounds extracted honey per colony. Write for circulars by dropping us a postal card.

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Italian BEES with Select PERSONALLY REARED QUEENS

2-Lb. Packages with Italian Queens	$1.75;	With Caucasian Queens	$1.85
3-Lb. Packages with Italian Queens	2.15;	With Caucasian Queens	2.25
Select Italian Queens	each $ .45	Caucasian Queens	each $ .55

For prices on special orchard packages, nuclei or Caucasian bees write. Prompt service, safe arrival and satisfaction guaranteed. Health certificate. Write for booklet and prices on large lots.

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Package Bees and Queens

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2-lb. Package with Queen, $1.50

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Select Young Queen, 50c

Quotations on quantity orders promptly furnished.

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Satisfaction Guaranteed.

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OUR QUEENS

for 1933 are far superior to any stock we have heretofore offered and it gives us great pleasure to announce that by careful breeding and selection from over a thousand tested queens during the past season we now have a strain of bees that is marvelous at honey getting. Our bees are the most gentle of any bees of any race or strain we have ever bred and we have tried everything that appeared to us to have any merit. In addition our bees show more yellow than ever before and are a delight to the eye. Furthermore our bees rob much less than any bee with which we ever had any experience. You can prove it by this simple test. Note how our yellow bees do not try to rob through the screen to your honey house, but note how the bees of darker color swarm around it. Then go out to the blossoms and see how our yellow bees are there and note the scarcity of the darker bees. I have shown this to visitors to our apiary many times and can demonstrate it any time during the breeding season. You will like our bees.

Tested and breeders can be shipped by return mail. Untested will be ready about May 15. A card will bring our book "About Bees" which is a brief treatise on beekeeping.

Untested queens, **$1.00** each. Tested, **$2.00** each. Breeding Queens shipped in large cage with one-half pound bees, service guaranteed through the season of 1933, **$7.50** each.

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If war should sweep the WORLD, would you be surprised?

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Write for new Low Prices on Italian or Caucasian Queens and Package Bees.

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Crop and Market Report

Compiled by M. G. Dadant

For our Crop and Market Report for the March issue of the American Bee Journal, we asked reporters to answer the following questions.

1. What per cent of extracted honey still unsold? Comb?
2. How are bees wintering so far?
3. Moisture and honey plant conditions.
4. Will the honey carryover for 1933 be as large as a year ago?

Per Cent Honey Unsold

The reports coming in this month seem to be much more favorable than one month or two months ago, and apparently there has been a spurt in honey sales in the meantime.

Some sections of New York are reporting as much as 25 per cent of the extracted honey left on hand and the New England states report considerable comb ranging from 20 to 40 per cent. Most of these, however, and in particular the southeast, seem to be almost entirely cleared up on both comb and extracted honey with the exception of Florida which still has quite a good percentage of the crop carried over. The same applies to the southern sections. Kentucky, however, has quite a large carryover of extracted amounting to about 30 per cent. Louisiana may have as much as 25 per cent and some sections of Texas report 20 per cent carryover while the extreme southern and heavy producing sections seem to be almost entirely cleared up.

Pennsylvania has considerable honey on hand and Ohio, Indiana, and Illinois report from 10 to 20 per cent still on hand. Iowa perhaps a little less. Missouri is well sold out. Michigan may have as much as 20 per cent on hand and Wisconsin 15 per cent. Minnesota seems to be one of the hard hit spots as far as honey sales are concerned and may have as high as 30 to 40 per cent of the extracted honey still left on hand. The plais states perhaps are showing the largest amount of honey left on hand, ranging from 10 per cent in Oklahoma to as high as 25 per cent in Kansas. Colorado ranges in with this area also, some reporters stating that their areas have as high as 50 per cent left on hand. In the other intermountain states, the percentages left on hand will range from 10 to 15 per cent with a little more than this in Idaho. Washington and Oregon also report rather heavy quantities on hand ranging from 20 to 30 per cent, but California, Arizona and New Mexico are pretty well sold out partly due to short crops.

In the Canadian provinces universally there has been an extremely good sale of honey and not probably over 10 per cent of the honey is left on hand in any of the provinces. We get reports of price advances in retail stores on honey showing that there is going to be a shortage.

How Did Bees Winter?

It is, of course, a little early to determine how bees have wintered throughout the north half of the country. We have, however, had some warm days and conditions would apparently lead one to believe that bees have wintered through so far in a very satisfactory condition. The states of Florida and Alabama as a matter of fact, are the only ones in the eastern half of the country which report anything as low as fair condition of bees. There are some reports in the northern states that there was too warm weather for bees and that brood has started and possibly the cold weather since has been a detriment.

Also reports from sections of Wisconsin and some of the plains states are that the warm weather induced so much brood rearing that the bees may possibly become short of stores before the spring opens.

In fact, the intermountain and plains states report more bees in "fair" condition than they do in "good" condition. On the Pacific seaboard all the bees seem to bee in very good shape.

Moisture and Honey Plants

The New England states and along the North Atlantic seaboard, conditions are only fair owing to the fact that the ground was bare during the fall and up until February, so that there is a question there as to whether or not the clover plants will carry through in satisfactory condition.

Extending entirely through the Southeast, however, there have been copious rains since the earlier dry spells and conditions seem to be from good to extra good in the entire area extending from the Carolinas and Maryland in the Northeast clear around through Arizona and New Mexico in the West.

In the north central states, particularly in the north tier of Wisconsin, Minnesota and the Dakotas, and extending south into Nebraska and Kansas, the complaint is that there has been too dry conditions without any snow and there is a question as to whether or not the snows arrived too late. Great snows, however, have tended to help the conditions somewhat, although the white clover producing areas seem to be worried about whether or not there will be a crop. In the states of Indiana, Ohio, Illinois, Iowa and Missouri, wonderful rain last fall seem to indicate that white clover plants should come through in excellent condition and that there is more than an average chance for a good yield this year.

In the intermountain states generally, the conditions are very good owing to the late snows with comewhat similar reports as from the plains states to the effect that the early drought may have had a bad tendency.

Along the Pacific seaboard, conditions are fair to good with more moisture in California than last year, although still not enough to satisfy beekeepers generally.

The Carryover

Much to the surprise of the writer, there has been considerable of a reversal of opinions since one month and two months ago as to the amount of honey on hand. Practically all states are now claiming that there will be less on hand than last year, and a majority of the reporters indicate that the honey cleanup will be satisfactory.

Some of the New England states are reporting more honey on hand than a year ago, and such states as Florida, Kentucky and Pennsylvania would indicate that the carryover would be about the same.

It is in the plains and intermountain states that there seems to be a heavier carryover, and the states we mention specifically are Minnesota, South Dakota, Nebraska, Kansas, Wyoming and Colorado.

All in all, our idea would be that from the reports received, that their carryover of honey from this year to next will be much less than it was a year ago.

Summary

All in all, we are struck with the possibility of there being a heavy honey crop this year with a short carryover and more enthusiasm displayed on the part of beekeepers than we had anticipated a month ago. A number of our reporters have stated that beekeepers are going to fill up old equipment and try to work their bees to the limit this year to produce at a profit. There is no particular optimism, but yet encouragement for the beekeeper to keep on particularly as the publicity given to honey during the past six months, has been unusually fine. We find it on the radio, in the newspapers and undoubtedly this will have a cumulative demand for honey which should lead to optimistic conditions particularly if prices range forward within the near future.

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Buy and Sell All Grades Extracted Honey
References: 1st National Bank, R. G. Dun or Bradstreets Commercial Reports.

The BEEKEEPER'S EXCHANGE

Copy for this department must reach us not later than the fifteenth of each month preceding date of issue. If intended for classified department, it should be so stated when advertisement is sent.

Rates of advertising in this classified department are seven cents per word, including name and address. Minimum ad, ten words.

As a measure of precaution to our readers, we require references of all new advertisers. To save time, please send the name of your bank and other references with your copy.

Advertisers offering used equipment or bees on combs must guarantee them free from disease, or state exact condition, or furnish certificate of inspection from authorized inspector. Conditions should be stated to insure that buyer is fully informed.

BEES AND QUEENS

MIDDLE TENNESSEE APIARIES Italian Queens, 60c each. Joe B. Tate, 1029 Lischey Ave., Nashville, Tenn.

THREE-BANDED Italian queens. Gentle and thrifty; as good as can be raised. Untested, 50c each; over six, 45c each. Jul. Buegeler, Alice, Texas.

LOOK for Latham's queen advertisement in April number.

ITALIAN bees and queens, two- and three-pound packages with young laying queens for early spring delivery. Write your needs. Service, satisfaction. Honey Bee Apiaries, Sandwich, Ill.

QUEENS—Very best Italians, 50c. Package bees at competitive prices. Will trade for white honey. Homer W. Richard, 1411 Champnolle, El Dorado, Ark.

QUEENS from Coffey now 50c each. Also package bees. Beeswax taken in exchange. Catalogue free. H. E. Coffey, Whitsett, Tex.

LIMITED number of package bees with young Italian or Caucasian queens at astoundingly low prices. To buy before you get our quotations would be a mistake. Prompt shipment and satisfaction guaranteed. H. G. Graham, Lane City, Texas.

CARNIOLAN and golden queens, tested, 75c and untested 50c each. 3 pounds of bees and queen, $2.00. 2 pounds of bees and queen, $1.50. Write for price of nuclei.
C. B. Bankston, Buffalo, Texas.

GOLDEN Italian queens that produce good workers and gentle to handle. Safe arrival and satisfaction guaranteed. Select tested, $1.50. Tested, $1.00. Untested about May, 50c. D. T. Gaster, Rt. 2, Randleman, N. C.

PACKAGE Bees and Queens. Lower prices for 1933. Two-pound package with queen, 5 to 100, $1.25 each. Two-pound package without queen, 5 to 100, $1.00 each. Three-pound package with queen, 5 to 100, $1.75 each. All shipments are made by express. Safe arrival guaranteed. Health certificate with every shipment. Little River Apiaries, Box 83, Gause, Texas.

CALIFORNIA PACKAGE BEES & QUEENS—Young three-banded bees shipped in new non-returnable packages, our YOUNG ITALIAN QUEENS are HOME GROWN, and the best that money can buy. Write today for new low prices. Thos. C. Burleson, Colusa, California.

GOLDEN Italian Queens and Bees for 1933, ones that are guaranteed to please you. One two-pound package with queen, $2.00. Ten or more, $1.75. Each queen, 60c each. $7.00 per dozen. Safe arrival. Health certificate with each package. E. F. Day, Honoraville, Alabama.

GOOD QUEENS AND PACKAGE BEES. The same good quality I furnished for many years as manager of the Achord Apiaries. Gentle, three-banded Italians, bred for honey gathering ability. Write for prices stating the quantity you want. H. C. Short, Fitzpatrick, Alabama.

HONEY FOR SALE

HONEY FOR SALE—Any kind, any quantity. The John G. Paton Company, 230 Park Avenue, New York.

FOR SALE—White clover honey in 60-pound cans. None finer. Satisfaction guaranteed. J. F. Moore, Tiffin, Ohio.

NEW CROP shallow frame comb honey, also section honey; nice white stock, securely packed, available for shipment now. Colorado Honey Prod. Ass'n, Denver, Colo.

HONEY FOR SALE—Keep your customers supplied with honey. We can furnish white and light amber honey at attractive prices. Packed in 60-lb., 10-lb. or 5-lb. tins. Dadant & Sons, Hamilton, Ill.

FOR SALE—Northern white, extracted and comb honey. M. W. Cousineau, Moorhead, Minn.

PALMETTO Mangrove or amber honey in barrels. Sample 6c. Peter W. Sowinski, Ft. Pierce, Fla.

NEW crop honey. Choice sweet clover extracted. Thomas Atkinson, R. 5, Omaha, Neb.

WHITE CLOVER honey, extracted, comb and chunk. One-pound sample 15c in stamps. F. W. Summerfield, Grand Rapids, Ohio.

AMBER and light amber, case or ton. E. S. Miller, Valparaiso, Ind.

TUPELO honey; will not granulate. Shipped in any quantity. Anthony Bros.' Honey Co., Apalachicola, Fla.

HONEY—We sell the best. Comb in carriers of eight cases each; extracted, basswood, buckwheat, sweet clover, white clover and light amber. A. I. Root Co. of Chicago, 224 West Huron St., Chicago, Illinois.

BASSWOOD HONEY—$3.00 per 60-lb. can. Henry Price, Elizabeth, Illinois.

FOR SALE—White clover comb. C. Holm, Genoa, Illinois.

MICHIGAN white clover-basswood honey of finest quality in new 60-lb. cans. Orval W. Dilley, Grand Ledge, Mich.

CLOVER HONEY in 60-lb. cans. Roy Littlefield, Exira, Iowa.

FOR SALE—Five tons white comb honey, wrapped and unwrapped. Fancy at $2.25 per case at our place. Quantity lots, 10 per cent discount. N. B. Querin & Son, R. 4, Bellevue, Ohio.

WE OFFER: No. 1, light amber Wisconsin honey, f.o.b. Menomonie, Wis., in new sixty-pound cans, two to the case, 5c a pound. Five cases or more, 4½c a pound. Large lots, 4c a pound. M. C. Berry & Co., Box 697, Montgomery, Alabama.

FOR SALE—Buckwheat honey, $4.50 for 120 lbs. Edw. Hogan, 210 Gibson Street, Canandaigua, N. Y.

FOR SALE—No. 1, clover comb honey $2.00 per case. No. 2, clover, $1.75. Discount caselots. Amber to dark extracted, 4c by the ton, 5c single case of two sixties.
H. G. Quirin, Bellevue, Ohio.

HOWDY'S HONEY: 100 cases of fancy comb, extra heavy and fine grade, still on hand. Howard Potter, Ithaca, Michigan.

EXTRA WHITE extracted, not mixed with capping melted. Geo. Seastream, Moorhead, Minnesota.

WHITE, Clover-basswood honey. New 60-lb. cans. By case, 4¾c; by ton, 4½c.
A. A. French & Son, Theresa, N. Y.

MAPLE SYRUP. Honey Wholesale-Retail. Valentine's, 524 West Michigan, Battle Creek, Michigan.

1933 New 100% Pure Maple Syrup, 'America's Greatest Natural Health Sweet,' Maple Cream and Sugar, any size package, glass, tin or paper. Lowest prices ever. Also part car of comb and extract honey. Write Griswold Honey Co., Madison, O., U. S. A.

CHOICE Michigan Clover Honey. New 60's. David Running, Filion, Michigan.

HONEY AND BEESWAX WANTED

WANTED—A car or less quantity of white honey in 60-lb. cans. Mail sample and quote lowest cash price for same. J. S. Bulkley, 816 Hazel St., Birmingham, Mich.

WANTED—Car lots honey; also beeswax, any quantity. Mail samples, state quantity and price. Hamilton, Wallace & Bryant, Los Angeles.

CARLOADS OR LESS—All grades extracted honey; also comb honey. Mail samples and delivered prices. C. W. Aeppler Company, Oconomowoc, Wis.

WANTED—Shipments of old comb and cappings for rendering. We pay the highest cash and trade prices, charging but 5 cents a pound for wax rendering. Fred W. Muth Co., 204 Walnut St., Cincinnati, Ohio.

WANTED—Mixed car comb and extracted or truck loads. M. Dillon, Fruitridge, Michigan.

WILL PAY CASH for honey. Send samples. Sherman Whitney, Puyallup, Washington.

FOR SALE

BEES, honey, beekeepers' supplies. Money-saving prices. Crenshaw County Apiaries, Rutledge, Ala.

VERY profitable bee business for sale in Canada. Sacrifice price. Address Box S, American Bee Journal.

FOR SALE—300 stands of bees. Address Kuster, Wheatland, Wyo.

$180.00 buys 90 colonies at apiaries. No American Foulbrood. Stuart Saunders, Chemung, N. Y.

FOR SALE or trade for queens: Root 40-frame hand driven extractor, 12" pockets; 90-gallon honey tank; large metal cappings box. Ten frame hives and shallow supers. Chas. S. Engle, Fargo, North Dakota.

MUST SELL—100 new Modified Dadant supers with frames, nailed and painted. 112 lbs. Dadant's wired foundation for the super frames. Lowry Elliott, Buffalo Gap, South Dakota.

GLADIOLUS - PANSIES—Your request for catalog cordially appreciated.
Frank A. Breck, 384 N. E. 42, Portland, Ore.

SUPPLIES

BEST QUALITY bee supplies, attractive prices, prompt shipment. Illustrated catalog on request. We take beeswax in trade for bee supplies. The Colorado Honey Producers' Association, Denver, Colo.

PORTER BEE ESCAPES save honey, money, avoid stings; faster most efficient. Sample 15c. R. & E. C. Porter, Lewistown, Ill.

FOR SALE—Queen mailing cages. Material, workmanship and service all guaranteed. Write for quantity prices. Hamilton Bee Supply Co., Almont, Mich.

FOR SALE—Comb foundation. Note these new low prices on 100-lb. lots: Medium Brood, 35c; Thin Section, 43c. Also wired foundation. Wax worked at lowest rates. E. S. Robinson, Mayville, N. Y.

I'LL MANUFACTURE your wax into Rietsche medium brood foundation at 2c per sheet on 15 lbs. or more—on less amounts, 3c. John Stegedirk, Hubbard, Iowa.

DIFFERENT, that's all. Written and published for the instruction of beekeepers. 52 pages of breezy entertaining beekeeping comment each month. One year, $1.00; two years, $1.50. Sample, 3c stamp.
The Beekeepers Item, San Antonio, Texas.

BARGAIN LIST—Every item in good, usable condition. Priced to sell quickly. Reason for selling, no longer listed in our catalog. Brushes, cartons, glass jars, lithographed pails, smokers, veils, box seats, feeders, section presses, shipping cases, foundation, queen cages, etc. Write for free list.
G. B. Lewis Company, Watertown, Wis.

WANTED

WANTED—Bees and equipment. Minnesota or Dakotas. Must be bargain. Box 105, Dwight, North Dakota.

YOUNG, experienced beekeeper wants position as first class helper. No bad habits. Orbie E. Hopkins, Poteau, Oklahoma.

WANTED, large apiary on shares or will buy. Eugene Gordon, Boulder, Colorado.

WILL EXCHANGE eighty acre farm for bees. H., Liberty, Missouri.

WANTED—Clean, industrious young man for helper. Must be willing worker. Give full particulars in first letter.
David Running, Filion, Michigan.

WILL BUY several hundred colonies if priced right. Distance immaterial.
Edward Klein, Gurnee, Illinois.

APICULTURE STUDENT, 26, desires practical experience in modern commercial apiary. References. Delphin Keiper, University Farm School, St. Paul, Minnesota.

MISCELLANEOUS

INCREASE honey crop two-fifths. Lhommedieu, Colo, Iowa.

PLANS FOR POULTRY HOUSES — All styles; 150 illustrations. Tells you the type to build for your particular locality. Secret of getting winter eggs, and copy of "Inland." Send 25c. Inland Poultry Journal, 523 Holliday Bldg., Indianapolis, Ind.

THE BEE WORLD—The leading bee journal in Great Britain and the only international bee review in existence. Specializes in the world's news in both science and practice of apiculture. Specimen copy, post free, 12 cents stamps. Membership of the Club, including subscription to the paper, 10/6. The Apis Club, Brockhill, London Road, Camberley, Surrey, England.

Honey Finds Another Outlet

Here at the American Bee Journal being located on one of the Illinois routes, we have quite a few tramps, and we have on hand in the lobby of the factory a quantity of half pound and pound jars of honey ready to give to anyone who drops in and asks for help in "smearing" a loaf of bread. We have quite a number of these tramps.

A new one was sprung on Swanson the other day, however, when the tramp came in with his quart jar empty, wanting it filled. That is certainly preparation in advance.

Which leads us to quote a little squib we saw in the paper the other day:

"Beehive Yourself.
Policeman: How did you come to get that jar of honey?
Tramp: Well, I admit I don't keep bees, but what's to stop a fellow squeezing honey out of the flowers himself?"

KitchenAid Lends A Hand to Honey

Miss Greulich of Kitchen Aid Company Troy, O., whose enthusiasm has led to thousands being told the honey way of food preparation.

Mrs. Jensen and Miss Taylor using KitchenAid in Institute kitchen.

What is it worth to have a honey recipe sent to every one in the U. S. A. owning a KitchenAid? Probably no single firm in the honey business could afford to do this, yet it was done without a penny's cost to beekeepers. Further it was sent during National Honey Week—all this because of the personal enthusiasm of Miss Greulich for honey.

This co-operation came through a contact by Mrs. Jensen at Denver in 1930. Since then KitchenAid has provided a mixer free for Institute workers at all state fairs. More, after seeing and tasting honey meringue made with their mixer, salesmen were instructed to carry a jar of honey and to make honey meringue hereafter in their demonstrations of KitchenAid. This friendship resulted in Mrs. Jensen meeting Mrs. Helen Watts Schreiber of the Kroger Foundation and having the latter feature honey recipes at some 40 cooking schools throughout the country, honey meringue and honey baked ham proving most popular. It is impossible to estimate the number of thousands of home makers who have thus heard the honey story for the first time.

If this sort of honey publicity provided by the Institute is worth anything it is worth YOUR HELP NOW. Money and honey are needed NOW to continue this work in 1933. Not one cent of salary goes to any official. All is spent for honey publicity. For these recipes write the KitchenAid Company, Troy, Ohio or the Institute. Send your contribution to Madison now or send honey to the nearest honey receiver to you. Refer to this bee journal for list of official honey receivers who work without pay.

AMERICAN HONEY INSTITUTE

417 North Few Street **Madison, Wisconsin**

(This Space Donated by Dadant & Sons)

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Accredited Bees and Queens

Our prices are very low. Our Superior quality bees and queens, plus our safe way in delivering them in perfect condition will be a big factor in your success. We have not lost a single package in FIVE years. There must be a reason. WRITE for prices, guarantee and particulars.

N. B. SMITH & CO. - - CALHOUN, ALABAMA

ADVERTISING PAGES REMOVED

The POSTSCRIPT

GOSSIP ABOUT THE OFFICE IN THE MAKING OF THE MAGAZINE

There seems to be something of a reaction against the campaign for wholesale burning of everything in the effort to control disease. I recently heard a very efficient chief apiary inspector say that he was convinced that it was better to save the equipment when it could be done safely and that he would not burn good equipment except in unusual cases.

E. M. Cole writes to say that as long as the burning continues, a real remedy for bee disease can never be developed. He says that while shaking, carelessly done, may spread disease, burning may also spread disease by carelessness. The discussion goes merrily on and will continue until some effective remedy is discovered.

— : —

Every time we make some new discovery we are faced with the probability that it was discovered by others before our time and has long since been forgotten. A case in point is the use of chlorine for treating foulbrood. In the British Bee Journal for the year 1909 will be found several articles dealing with this subject.

— : —

In last month's Postscript, E. L. Sechrist was misquoted. I misread his letter about the combination of the arsenate spray and the one to control blight. As I now understand him, he says that fruit growers do combine the two and apply during the blooming of the pears much to the concern of the beekeepers who must move their bees away. The result is **much less blight on the sprayed trees** than the unsprayed ones. Apologies are due both to Sechrist and to Doctor Rosen. (Page 80.)

— : —

In the February Journal, Jay Smith states that he will not be satisfied until he is able to get his queens to lay directly in queen cells and thus remove the necessity for grafting. Last winter in Florida, Alfred Pering told me the same thing. Pering indicated that he felt he had about reached the solution of the problem. Doolittle became famous for his cell cups and his system of artificial grafting. If this method of queen rearing is superseded, Doolittle is likely to be forgotten even as Henry Alley has been. Alley was the first to find a practical method of commercial queen rearing and his fame seemed secure until Doolittle found a better way. We will await with interest to see who is first to show us further improvement.

— : —

That article on page 84 reminds me of the day when I visited Mr. Straight at his experiment station. British Columbia is a delightful region. If the world at large was familiar with its attractions the population would not be so sparse. There is an immense area of untouched wilderness, with a mild climate, and a wealth of plant growth.

— : —

In a letter from R. W. Cram of Maquoketa, Iowa, he tells of a swarm of bees which has been under his farm house for fourteen years. He states that they have swarmed only twice in all that time, which indicates that bees with plenty of room are not much inclined to swarm. The Dadants have long called attention to this fact in their arguments for the large hives.

— : —

Some shippers will be surprised to read in the Minall article on page 86 that bees shipped on combs have not done as well as package bees, in Saskatchewan. The restrictions because of disease have greatly reduced the movement of bees on combs. I am inclined to think, like Mr. Minall, that package bees give better results, so the buyer has not been greatly inconvenienced by such regulations. That article tells some of the grief which the buyer of packages has had to face.

— : —

I have been criticized for saying that the worst drawback to the package business is that too many poor queens are sent out. It is refreshing to read on page 93 the statement of a queen breeder to the same effect. Jay Smith says, "The fact is that all of us are rearing too many poor queens."

The demand for low priced queens is partly at the bottom of the trouble. It is hard to see how a queen breeder can sell queens at the present low prices and still give high quality. The fact is very well known, however, that there is a large percentage of supersedure where queens have been shipped to distant points. Where the fault lies remains to be determined.

— : —

This grandfather business grows on one. Since my second grandson, David Louis, has arrived I feel quite important. "Dave" will be a new name in the Pellett family. The first one named for his granddad arrived in 1930. Girls are scarce in our group. So far only two have appeared in three generations.

— : —

The exchanges that come to the editorial desk are very thin. One livestock journal which once came out with about 120 pages to an issue now has only eighteen. Poultry papers have reduced in similar manner. There is plenty of grief to go around.

— : —

That little article about hyssop on page 87 reminds me of some interesting visits to western Canada beekeepers where hyssop is an important source of high quality honey. The picture was taken at Newton's apiary near Winnipeg in 1925. Hyssop was once the source of honey in Iowa but with the settlement of the country and breaking of the wild land it nearly disappeared. I still have a few plants of one species in my wild flower preserve. Six or seven feet is about the height to which it grows for me.

— : —

Florida beekeepers are preparing a bulletin entitled "A Hundred Uses for Florida Honey." That sounds like business. A hundred uses for any product ought to be interesting reading for the consumer.

— : —

We have received numerous reports of uncertainty concerning appropriations for continuing beekeeping work in several of the states. Beekeeping is usually thought of as unimportant in the industries, and as such is among the first to get the axe. We hope that really important work will be continued, but then those connected with every industry think of their own as important and ask that cuts be made elsewhere.

— : —

After talking with many farmers, I have came to doubt whether any of the noisy self styled spokesmen for agriculture at Washington really represent any very large group. Most of those with whom I have discussed the matter seem very skeptical concerning any such farm relief plan as that of the debenture or farm allotment, or even the farm board. Relief from the tax burden and an adjustment of barriers which will permit the revival of trade are more in line with their demands. Many say to be relieved from government relief would be the greatest help.

— : —

The closing of local banks has caused many of us to feel the pinch in such a way as to make the depression very real. When a fellow is reduced to his last nickel he remembers with longing the easy money which he spent so freely in the boom days.

— : —

With reference to the discussion of granulated honey in the January postscript, a Chicago lady suggests that we might refer to such honey as "evaporated honey." The fact is that the moisture is so nearly evaporated from nectar in the process of storing by the bees that very little additional evaporation is possible.

Some terms in common use are not well suited to convey the right idea to the uniformed public. There is much complaint that the word "granulated" as applied to honey is misleading.

Frank C. Pellett.

The
AMERICAN BEE JOURNAL

Established by Samuel Wagner in 1861

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